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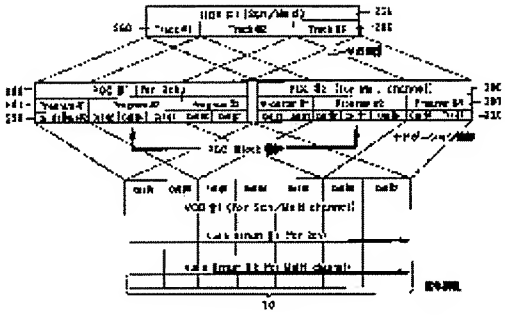
(71)Applicant : PIONEER ELECTRON CORP

(72)Inventor : SAWABE TAKAO
YAMAMOTO KAORU
ISHII HIDEHIRO
EMA SHOZO
TAKAHASHI TOKIHIRO
HASEGAWA YOSHIMORI

(54) INFORMATION RECORDING MEDIUM AND REPRODUCING DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide an information recording medium which can reproduce appropriately respective audio information without disturbing users even when plural audio information different in a recording/reproducing mode, an encoding system or the like are recorded in a disk, and to provide a reproducing device which can reproduce appropriately respective audio information by the information recording medium.



SOLUTION: Audio information of two channels reproduction is recorded in an audio stream #1, audio information of multichannels reproduction is recorded in an audio stream #2, and the audio stream is multiplexed in each cell constituting audio actual information VOB #1. Each cell constituting the audio actual information is sectioned by programs #1-#3 having a unit of track 260 of one music and the like, and the programs #1-#3 are controlled by two PGC #1 and PGC #2. The PGC #1 has information reproducing the audio stream #1, and the PGC #2 has information reproducing the audio

stream #2.

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CLAIMS

[Claim(s)]
[Claim 1] The information record medium which is the information record medium which has the sound information record section where two or more sound information that recording methods differ was recorded, and the control-information record section where control information required for playback of the sound information recorded on this sound information record section was recorded, and is characterized by what the identification information which shows that said sound information is the sound information on the same contents that said recording methods differ to the control information recorded on said control-information record section is contained for.
[Claim 2] In order to classify into said control information two or more sound information recorded on said sound information record section for every 1st partition unit The 1st partition information which identifies each 1st partition unit is included further. As said identification information The information record medium according to claim 1 with which the 1st partition information which shows that the sound information to classify belongs per the 1st same partition is characterized by what is prepared for every sound information on the same contents from which said recording method differs.
[Claim 3] In order to classify into said control information two or more sound information recorded on said sound information record section for every 2nd partition unit as one playback unit The 2nd partition information which identifies each 2nd partition unit, and the sound information classified for said every 1st partition unit using said 1st partition information so that it may constitute from sound information on 1 or two or more 2nd partition units The management information which connects said 2nd partition information and said 1st partition information is contained further. As opposed to the 1st partition information which identifies the same 1st partition unit to which the sound information on the same contents that said recording methods differ belongs So that the 2nd partition information which identifies the same 2nd partition unit to which the sound information on the same contents that said recording methods differ belongs may be connected, respectively for every sound information on the same contents from which said recording method differs The information record medium according to claim 2 characterized by what two or more management information for every sound information concerned is prepared for.
[Claim 4] Each of two or more of said management information is an information record medium according to claim 3 characterized by connecting the 2nd partition information which identifies a respectively equal number and the 2nd partition unit of sequence to said 1st partition information, respectively for every sound information on the same contents from which said recording method differs.
[Claim 5] The sound information classified for every 2nd partition unit using the 2nd partition information connected, respectively for every sound information on the same contents from which said recording method differs is an information record medium according to claim 4 characterized by to record playback time amount on the sound information record section as almost equal sound information for every sound information on the same contents from which said recording method differs to said 1st partition information.

[Claim 6] The sound information on the same contents that said recording methods identified by said identification information differ is an information record medium given in any 1 term of claim 1 characterized by what multiplex is carried out to the same record location in a sound information record section, and is recorded on it thru/or claim 5.
[Claim 7] An information record medium given in any 1 term of claim 1 characterized by including the information which shows said recording method as information which chooses the sound information on the same contents of which recording method from two or more sound information on the same contents that said recording methods differ in said control information thru/or claim 6.
[Claim 8] Said recording method is an information record medium given in any 1 term of claim 1 characterized by being any of a sound recording gestalt, a playback gestalt, or a coding method, one, or such combination thru/or claim 7.
[Claim 9] It has the sound information record section where two or more sound information that recording methods differed was recorded, and the control information record section where control information required for playback of the sound information recorded on this sound information record section was recorded. From the information record medium which contains in the control information concerned the identification information which shows that said sound information is the sound information on the same contents that said recording methods differ A reading means to be the regenerative apparatus which reproduces said sound information according to said control information, and to read the recording information recorded on the information record medium, An input means to input the assignment information which specifies the conditions which should be reproduced, and a reading means to read the control information recorded on the information record medium, A selection means to choose the recording method to reproduce based on said assignment information or the setting information memorized by the storage means, The regenerative apparatus characterized by having a playback means to reproduce the sound information on the recording method made to choose with said selection means based on said control information out of two or more sound information on the same contents that said recording methods differ.
[Claim 10] The regenerative apparatus according to claim 9 characterized by having further an extract means to extract the information which shows said recording method of each sound information recorded on the information record medium concerned from said control information, and the display means of the recording method information which displays the extracted information.
[Claim 11] It is the regenerative apparatus according to claim 9 or 10 which carries out [that said input means is not concerned with the operating state of a regenerative apparatus, but are set up so that the input of said assignment information may receive, and said selection means or said playback means are set up so that each processing may perform based on said changed assignment information, when the contents of said assignment information inputted with said input means have modification, and] as the description.
[Claim 12] A regenerative apparatus given in any 1 term of claim 9 characterized by having further the rewriting means which rewrites the contents of the setting information memorized by said storage means thru/or claim 11.
[Claim 13] A regenerative apparatus given in any 1 term of claim 9 characterized by having further an alarm display means to perform an alarm display when said recording method chosen by said selection means cannot process with the regenerative apparatus concerned based on said assignment information or said setting information thru/or claim 12.
[Claim 14] Said selection means is a regenerative apparatus given in any 1 term of claim 9 characterized by being set up so that a recording method may be chosen in an initialization condition based on the initialization information memorized by said storage means thru/or claim 13.
[Claim 15] To a regenerative apparatus given in any 1 term of claim 9 thru/or claim 11 The rewriting means which rewrites the contents of the setting information memorized by said storage means, When said recording method chosen by said selection means cannot process with the regenerative apparatus concerned based on said assignment information or said setting information In an alarm display means to perform an alarm display, and an initialization condition It has the selection means set up so that a

recording method may be chosen as said storage means based on the initialization information memorized beforehand. This selection means Furthermore, the assignment information first inputted by said input means unless said alarm display by said alarm display means was performed, Next, the setting information rewritten by said rewriting means, the regenerative apparatus characterized by being set up so that the recording method based on each information may be chosen as the last by the priority of said initialization information.

[Claim 16] It is a regenerative apparatus given in any 1 term of claim 9 which is further equipped with a detection means to detect the insertion condition over the headphone jack of a headphone plug, and is characterized by setting up said playback means so that the sound information by which binaural sound recording was carried out when it was detected that the headphone plug was inserted in the headphone jack by this detection means may be reproduced thru/or claim 15.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention belongs to the technical field of the regenerative apparatus which reproduces sound information from an information record medium and these information record media, such as a DVD disk with which sound information, such as music from which a sound recording gestalt, a playback gestalt, or a coding method differs, was recorded.
[0002]
[Description of the Prior Art] Video DVD (disk based on DVD-Video specification) is known as a record medium which records image information, such as a movie. Video DVD is widely used as a record medium of image information, such as a movie, from the large capacity nature.
[0003] Moreover, the audio DVD (disk based on DVD-Audio specification) bearing recording only audio information, such as music instead of image information, such as a movie, in mind is developed. It becomes possible from the large capacity nature as a DVD to record the audio information equivalent to two or more CDs (compact disk) on the audio DVD of one sheet at this audio DVD. Moreover, it is also possible to record audio information which is equivalent to the music CD of the sound track version of the movie in addition to image information, such as a movie.
[0004]
[Problem(s) to be Solved by the Invention] Audio DVD is going to enable playback of the multichannel which is not for the purpose of mainly recording audio information, such as music, until now. Moreover, it is going to enable not only a multichannel but high-definition playback which is not as 2ch stereophonic reproduction until now.
[0005] In such a DVD audio disk, when only the audio information on a multichannel is recorded, the people with the regenerative apparatus only for 2ch(es) produce the problem that cannot hear only some of the sounds or they can completely be reproduced.
[0006] Then, in order for people only with the regenerative apparatus only for 2ch(es) to also enable it to enjoy this disk, it is necessary to record the audio information for 2ch playback on a disk with the audio information on a multichannel.
[0007] However, two kinds of this audio information records the title same naturally and the same music in this case. Therefore, in having recorded two kinds of this audio information on the disk as it is, there is the 1st problem that the title of a same name and two kinds of music of a same name will exist, and cause a user's derangement. This 1st problem was [when sound recording gestalten, such as not only when playback gestalten such as a channel, differ, but binaural sound recording differed, or] a problem produced similarly, when coding methods, such as AC-3, differed, and the combination of these playback gestalten, a sound recording gestalt, or a coding method differed further.
[0008] Next, in the already standardized DVD video format, two or more audio information is recordable on coincidence with image information. For example, the voice of original language and the voice of a Japanese stand-in can be switched to a certain movie. Moreover, it is also possible to switch LPCM stereo voice and AC-3 multichannel voice in the same title similarly. Therefore, two or more

audio information can be treated as the same title and the same music, and the class of audio information to reproduce can be changed now by changing an audio stream.
[0009] On the other hand, there is also a demand of wanting to record image information on Audio DVD, and it is going to enable record of a menu or additional information image information. In this case, a video format and transposition cannot be taken in having recorded the picture by different approach from a DVD video format. It is desirable for playback of a part with the picture of an audio disk to be also able to do the video player in a current commercial scene.
[0010] Therefore, it is necessary to make into the same structure as a DVD video format structure which records the stereo information at the time of being accompanied by the image also from these viewpoints.
[0011] However, for that, it is necessary to carry out multiplex [of two or more kinds of audio information], and to record on a disk as one object. Moreover, in order to manage two or more streams, it is necessary to place management information also into data. Therefore, when it will have the same structure as a video format, while there is little processing required for the change at the time of playback by the regenerative apparatus, the fault that the processing at the time of record becomes complicated is produced.
[0012] The function as an object for sound recording and adjustment with the studio device by which current use is carried out are thought as important, the audio format is asked for especially the processing at the time of record not being complicated, and the structure where management information is not placed especially into data is needed for it.
[0013] Therefore, two kinds of structures, structure original with the DVD audio format in the case of recording only audio information and the structure based on the DVD video format at the time of being accompanied by the image, are needed. Thus, when it is going to reproduce only speech information to the data of two kinds of structures, since two kinds of completely different formats will exist, processing of a regenerative apparatus becomes heavy and the playback control information cannot offer unific actuation unless it makes it into the common logical structure, it has the 2nd problem of producing a user's derangement.
[0014] This invention is made in view of the above point, and it makes it the 1st technical problem to offer the regenerative apparatus which can reproduce each audio information appropriately with the information record medium which can reproduce each audio information appropriately, and the information record medium concerned, without giving derangement to a user, even if it is the case where two or more audio information that a sound recording gestalt and a playback gestalt differ from a coding method etc. is recorded on a disk.
[0015] Moreover, even when it has two kinds of structures, structure original with the DVD audio format in the case of recording only audio information, and the structure based on the DVD video format at the time of being accompanied by the image, it is making into the 2nd technical problem to offer the information record medium which can offer the environment which chooses two or more kinds of audio information by unific actuation, and the regenerative apparatus which enables the suitable playback further, without being conscious of a difference of the structure of each disk.
[0016]
[Means for Solving the Problem] The sound information record section where two or more sound information that recording methods differed was recorded in order that an information record medium according to claim 1 might solve said technical problem, In the information record medium which has the control information record section where control information required for playback of the sound information recorded on this sound information record section was recorded, to the control information recorded on said control information record section It is characterized by containing the identification information which shows that said sound information is the sound information on the same contents that said recording methods differ.
[0017] According to the information record medium according to claim 1, the control information recorded on the control information record section will be read with a regenerative apparatus, retrieval of the sound information on the request out of the sound information recorded on the sound information

record section will be performed based on this control information, and playback about the retrieved sound information will be performed. Therefore, when two or more sound information that recording methods differ about the same contents is recorded on said sound information record section, the aforementioned retrieval is needed for each sound information of every. However, in this invention, it will be recognized by the identification information contained in said control information that the sound information on said request is such sound information, and assignment according to the contents of the sound information will only be performed in the phase where a user specifies the sound information which it is going to reproduce with a regenerative apparatus, for example, the retrieval and playback of a recording method of sound information according to the throughput of a regenerative apparatus will be performed. Thus, since the sound information on the same contents that recording methods differ is manageable under the contents concerned according to this invention, derangement is not given to a user.

[0018] An information record medium according to claim 2 is set to an information record medium according to claim 1, in order to solve said technical problem. To said control information In order to classify two or more sound information recorded on said sound information record section for every 1st partition unit The 1st partition information which identifies each 1st partition unit is included further, and it is characterized by establishing the 1st partition information which shows that the sound information to classify belongs per the 1st same partition as said identification information for every sound information on the same contents from which said recording method differs.

[0019] According to the information record medium according to claim 2, the 1st partition information as control information recorded on the control information record section will be read with a regenerative apparatus, retrieval of the 1st partition unit to which the sound information on desired belongs will be performed, and playback about the sound information which belongs per the 1st searched partition will be performed. Therefore, when two or more sound information that recording methods differ about the same contents is recorded for every 1st partition unit, retrieval of the 1st partition unit is needed for each sound information of every. However, in this invention, the 1st partition information which shows that the sound information to classify belongs per the 1st same partition as said identification information is established for every sound information on the same contents from which said recording method differs. That is, although recording methods differ, respectively, such sound information belongs per the 1st same partition, and is the same. [of the contents of the 1st partition information] Consequently, the assignment to such sound information is easy to correspond to the single 1st partition information. And since this single 1st partition information is established for every sound information on the same contents from which said recording method differs, it will be recognized in the case of reading of the 1st partition information that the sound information on desired is such sound information. And after this recognition is performed, playback about the sound information on a recording method according to the throughput of a regenerative apparatus will be performed among the sound information which belongs per the 1st single partition shown using the single 1st partition information concerned. Thus, since the sound information on the same contents that recording methods differ is manageable under the contents concerned according to this invention, even if it is the sound information on the same contents that said recording methods differ, a user does not need to specify for every sound information and does not give a user derangement.

[0020] An information record medium according to claim 3 is set to an information record medium according to claim 2, in order to solve said technical problem. To said control information In order to classify two or more sound information recorded on said sound information record section for every 2nd partition unit as one playback unit The 2nd partition information which identifies each 2nd partition unit, and the sound information classified for said every 1st partition unit using said 1st partition information so that it may constitute from sound information on 1 or two or more 2nd partition units The management information which connects said 2nd partition information and said 1st partition information is contained further. As opposed to the 1st partition information which identifies the same 1st partition unit to which the sound information on the same contents that said recording methods differ belongs It is characterized by preparing two or more management information for every sound

information concerned so that the 2nd partition information which identifies the same 2nd partition unit to which the sound information on the same contents that said recording methods differ belongs may be connected, respectively for every sound information on the same contents from which said recording method differs.

[0021] According to the information record medium according to claim 3, the 1st partition information as control information recorded on the control information record section is read with a regenerative apparatus, and retrieval of the 1st partition unit to which the sound information on desired belongs is performed. Next, the management information corresponding to the 1st partition information which shows the restrained 1st partition unit is read, and the 2nd partition information connected with the 1st partition information concerned is read. About the sound information on the 1st partition unit searched previously, retrieval of the 2nd partition unit will be performed further and sound information will be reproduced for every playback unit by this 2nd partition information. Moreover, when assignment in the 2nd partition unit is directly performed by the user, retrieval of the 2nd partition unit specified by the same procedure will be performed, and only the sound information on the specified 2nd partition unit will be reproduced.

[0022] Next, when two or more sound information that recording methods differ about the same contents is recorded for every 1st partition unit, the 1st partition information which shows that the sound information to classify belongs per the 1st same partition as said identification information is established for every sound information on the same contents from which said recording method differs. Furthermore, the 2nd partition information is connected with such 1st partition information by management information for every sound information on the same contents from which said recording method differs, and this 2nd partition information gives the same 2nd partition unit to which the sound information on the same contents that said recording methods differ belongs. Although the 1st partition information is established for every sound information on the same contents from which said recording method differs as mentioned above, although the single 1st partition information will be given, the 2nd partition information is also established for every sound information on the same contents from which said recording method differs, the contents are [the contents are the same,] the same, and the single 2nd partition information is given. Therefore, even when reproducing the sound information on a different recording method, retrieval of the 1st partition unit mentioned above and retrieval processing of the 2nd partition unit are the same about the sound information on each recording method, and can be performed by single processing under single assignment of playback of the 2nd partition unit which the 2nd partition unit followed and which was reproduced or specified. thus, the sound information on the same contents that recording methods differ according to this invention -- the bottom of the contents concerned -- and since it is manageable for every playback unit, even if it is the sound information on the same contents that said recording methods differ, a user does not need to specify for every sound information and does not give a user derangement

[0023] In order that an information record medium according to claim 4 may solve said technical problem, in an information record medium according to claim 3, each of two or more of said management information is characterized by connecting the 2nd partition information which identifies a respectively equal number and the 2nd partition unit of sequence to said 1st partition information, respectively for every sound information on the same contents from which said recording method differs.

[0024] Even if the 2nd partition information connected with the 1st partition information, respectively for every sound information on the same contents from which said recording method differs is two or more 2nd partition unit **** case according to the information record medium according to claim 4, the number and sequence of the 2nd partition unit are equally set up for every sound information on the same contents of two or more of said management information from which it is alike, respectively and said recording method differs more. Therefore, the procedure for performing the retrieval and playback of the n-th 2nd partition unit which divide the 1st partition unit can be made the same for every sound information on the same contents from which said recording method differs, and can attain simplification of processing. Since this leads to communalization of processing by the regenerative

apparatus and leads to communalization of actuation by the user further, it can prevent giving a user derangement much more certainly.

[0025] An information record medium according to claim 5 is set to an information record medium according to claim 4, in order to solve said technical problem. The sound information classified for every 2nd partition unit to said 1st partition information using the 2nd partition information connected, respectively for every sound information on the same contents from which said recording method differs It is characterized by recording playback time amount on the sound information record section as almost equal sound information for every sound information on the same contents from which said recording method differs.

[0026] even if the 2nd partition information connected with the 1st partition information, respectively for every sound information on the same contents from which said recording method differs is two or more 2nd partition unit **** case according to the information record medium according to claim 5 -- the 2nd partition unit -- it is recorded that the playback time amount of the sound information boiled and classified becomes almost equal for every sound information on the same contents from which said recording method differs. Therefore, it can prevent much more certainly not giving sense of incongruity to a user and giving a user derangement with the playback system according to each recording method, even when reproducing sound information.

[0027] In order that an information record medium according to claim 6 may solve said technical problem, in an information record medium given in any 1 term of claim 1 thru/or claim 5, sound information on the same contents that said recording methods identified by said identification information differ is characterized by what multiplex is carried out to the same record location in a sound information record section, and is recorded on it.

[0028] According to the information record medium according to claim 6, the sound information on the same contents that said recording methods identified by said identification information differ will be recorded per record of a sound information record section, but irrespective of the recording method of the sound information concerned, the record unit is the same, and moreover, multiplex [of it] is carried out to the same record location concerned, and it is recorded on it. Therefore, after identifying that it is the sound information on the same contents that said recording method changes with identification information, said record unit on which the sound information on desired was recorded based on control information can be searched, and only the sound information on the request of the sound information by which multiplex was carried out into the searched record unit can be reproduced. Although especially retrieval of said record unit over two or more sound information on the same contents that said recording methods differ in invention concerning any of claim 2 thru/or claim 5 they are is performed based on the single 1st partition unit shown using the single 1st partition information Since the single 1st partition information is established for two or more sound information of every on the same contents from which said recording method differs, the information which chooses each sound information can be given to the hierarchy of the 1st partition information level. Therefore, the sound information recorded in the DVD video format is reproducible based on the control information corresponding to a DVD audio format.

[0029] An information record medium according to claim 7 is characterized by including the information which shows said recording method at said control information in an information record medium given in any 1 term of claim 1 thru/or claim 6 as information which chooses the sound information on the same contents of which recording method from two or more sound information on the same contents that said recording methods differ, in order to solve said technical problem.

[0030] According to the information record medium according to claim 7, the sound information on the same contents of the desired recording method will be easily chosen from two or more sound information on the same contents that said recording method changes with said identification information based on the information which shows said recording method contained in said control information when it has been recognized that the sound information on desired is the sound information on the same contents that said recording methods differ. Moreover, when the regenerative apparatus which is going to reproduce this information record medium is what cannot process the recording

method of said request, it can warn of the purport that assignment of the recording method concerned by the user is invalid, easily.
[0031] In order that an information record medium according to claim 8 may solve said technical problem, in an information record medium given in any 1 term of claim 1 thru/or claim 7, said recording method is characterized by being any of a sound recording gestalt, a playback gestalt, or a coding method, one, or such combination.
[0032] According to the information record medium according to claim 8, two or more sound information on the same contents that any of a sound recording gestalt, a playback gestalt, or a coding method or one differ from such combination is recorded, and suitable playback of the sound information according to the capacity of the regenerative apparatus which reproduces the information record medium concerned, having corresponded to the demand of a user will be performed, without causing a user's derangement.
[0033] The sound information record section where two or more sound information that recording methods differed was recorded in order that a regenerative apparatus according to claim 9 might solve said technical problem, It has the control information record section where control information required for playback of the sound information recorded on this sound information record section was recorded. In the regenerative apparatus with which said sound information reproduces said sound information to the control information concerned according to said control information from the information record medium containing the identification information which shows that it is the sound information on the same contents that said recording methods differ A reading means to read the recording information recorded on the information record medium, and an input means to input the assignment information which specifies the conditions which should be reproduced, A selection means to choose said recording method based on said assignment information or the setting information memorized by the storage means, It is characterized by having a playback means to reproduce the sound information on the recording method made to choose with said selection means from two or more sound information on the same contents that said recording methods differ based on said control information.
[0034] If a user specifies the conditions which should be reproduced with an input means according to the regenerative apparatus according to claim 9, this assignment information will be inputted by the input means concerned. Next, the control information corresponding to the assignment information inputted in this way is read in an information record medium by the reading means. Moreover, based on the inputted assignment information or the setting information memorized by the storage means, the recording method which the user specified or is reproduced with a selection means according to the capacity of a regenerative apparatus is chosen. Next, the sound information on the recording method made to choose with said selection means will be reproduced by the playback means based on said control information out of two or more sound information on the same contents that said recording methods differ. Therefore, playback of the sound information on a predetermined recording method will be performed only by a user performing assignment according to the contents of the sound information on desired. Thus, according to this invention, the sound information on the same contents that the recording methods recorded on the information record medium differ can be reproduced appropriately, without giving a user derangement.
[0035] A regenerative apparatus according to claim 10 is characterized by having further an extract means to extract the information which shows said recording method of each sound information recorded on the information record medium concerned from said control information, and the display means of the recording method information which displays the extracted information in a regenerative apparatus according to claim 9, in order to solve said technical problem.
[0036] According to the regenerative apparatus according to claim 10, the information which shows said recording method of each sound information recorded on the information record medium concerned is extracted from said control information by the extract means. And the extracted information will be displayed by the display means of recording method information. Therefore, a user can specify the recording method to reproduce with reference to the displayed recording method information, and the suitable playback according to a demand of a user is possible for him.

[0037] A regenerative apparatus according to claim 11 is set to a regenerative apparatus according to claim 9 or 10, in order to solve said technical problem. Said input means It is not concerned with the operating state of a regenerative apparatus, but it is set up so that the input of said assignment information may be received. Said selection means or said playback means When the contents of said assignment information inputted with said input means have modification, it is characterized by being set up based on said changed assignment information, so that each processing may be performed.
[0038] according to a regenerative apparatus according to claim 11 -- a regenerative apparatus -- playback -- whether it is working or is under halt, the input of the assignment information on said sound information by the user is received by the input means. And when the contents of said assignment information inputted by doing in this way have modification, each processing is performed by said selection means or said playback means based on said changed assignment information. Therefore, since a demand of users, such as modification of a recording method, can be made to reflect in playback of sound information on real time, according to a demand of a user, playback suitable [one layer of reliances] is possible.
[0039] A regenerative apparatus according to claim 12 is characterized by having further the rewriting means which rewrites the contents of the setting information memorized by said storage means in a regenerative apparatus given in any 1 term of claim 9 thru/or claim 11, in order to solve said technical problem.
[0040] According to the regenerative apparatus according to claim 12, if a user directs rewriting of said setting information with a rewriting means, the contents of the setting information memorized by said storage means will be rewritten by the rewriting means. Therefore, since ** which makes the recording method which suited the use mode of a regenerative apparatus etc. memorize beforehand according to a demand of a user is made, a suitable operating environment can be offered.
[0041] A regenerative apparatus according to claim 13 is characterized by equipping it with an alarm display means to perform an alarm display, further, when said recording method chosen as any 1 term of claim 9 thru/or claim 12 by said selection means in the regenerative apparatus of a publication based on said assignment information or said setting information cannot process in the regenerative apparatus concerned, in order to solve said technical problem.
[0042] According to the regenerative apparatus according to claim 13, an alarm display is performed by the alarm display means when said recording method chosen by the selection means based on said assignment information or said setting information cannot process in the regenerative apparatus concerned. Therefore, assignment or rewriting of the suitable recording method according to the capacity of a regenerative apparatus is possible for a user.
[0043] In order that a regenerative apparatus according to claim 14 may solve said technical problem, in a regenerative apparatus given in any 1 term of claim 9 thru/or claim 13, said selection means is characterized by being set up so that a recording method may be chosen based on the initialization information memorized by said storage means in an initialization condition.
[0044] According to the regenerative apparatus according to claim 14, in an initialization condition, selection of the recording method by said selection means is performed based on the initialization information beforehand memorized by said storage means. Therefore, suitable playback is possible by the recording method which suited the regenerative apparatus, without troubling a user's hand.
[0045] In a regenerative apparatus given in any 1 term of claim 9 thru/or claim 11 in order that a regenerative apparatus according to claim 15 may solve said technical problem The rewriting means which rewrites the contents of the setting information memorized by said storage means, When said recording method chosen by said selection means cannot process with the regenerative apparatus concerned based on said assignment information or said setting information In an alarm display means to perform an alarm display, and an initialization condition It has the selection means set up so that a recording method may be chosen as said storage means based on the initialization information memorized beforehand. This selection means Furthermore, the assignment information first inputted by said input means unless said alarm display by said alarm display means was performed, Next, it is characterized by being set up so that the recording method based on each information may be chosen as

the setting information and the last which were rewritten by said rewriting means by the priority of said initialization information.

[0046] According to the regenerative apparatus according to claim 15, although it will be based on any of the information which the user specified as real time, the setting information which the user rewrote beforehand, or initialization information a recording method is and will be chosen by the selection means, priority is prepared in this selection processing. This priority serves as assignment of the capacity of regenerative-apparatus confidence and the user of real time, rewriting of the setting information by the user, and sequence of initial setting. Therefore, since the capacity of regenerative-apparatus confidence is given top priority, the recording method which does not suit a regenerative apparatus is not chosen. Moreover, when the assignment or rewriting by the user is not performed, a suitable recording method is chosen by initialization information. However, suitable playback in which the demand of the maximum user was made to reflect can be performed, choosing the recording method which suited the regenerative apparatus, since it can specify on real time even when this information can be suitably rewritten according to a demand of a user and still such rewriting is performed.

[0047] In a regenerative apparatus given in any 1 term of claim 9 thru/or claim 15 in order that a regenerative apparatus according to claim 16 may solve said technical problem It has further a detection means to detect the insertion condition over the headphone jack of a headphone plug. Said playback means When it is detected that the headphone plug was inserted in the headphone jack by this detection means, it is characterized by being set up so that the sound information by which binaural sound recording was carried out may be reproduced.

[0048] According to the regenerative apparatus according to claim 16, if a user inserts a headphone plug in a headphone jack, this insertion will be detected by the detection means and will retrieve the sound information by which binaural sound recording was carried out. Therefore, especially when the sound information by which binaural sound recording was carried out is recorded on the information record medium which it is going to reproduce, even if it does not perform actuation of specifying this sound information by which binaural sound recording was carried out, the sound information which suited headphone playback and by which binaural sound recording was carried out will be reproduced. Therefore, it is possible to perform suitable playback according to an operating condition, making complicated actuation by the user unnecessary.

[0049]

[Embodiment of the Invention] Hereafter, the suitable operation gestalt of this invention is explained with reference to a drawing.

[0050] (1) They are image information and speech information (music information is also included.) at the beginning of a DVD video format. Hereafter, the record format on the video [being the same] DVD (physical record format) is explained using drawing 1 .

[0051] (1.1) As shown in physical format drawing 1 , video DVD 1 has the lead-out area LO in the outermost periphery while having the lead-in groove area LI in the most-inner-circumference section, and the meantime is a video video zone, and it is divided and recorded on two or more VTS(Video Title Set) 4 (VTS#1 thru/or VTS#n) to which image information and speech information have ID (discernment) number in each. It is the set (settlement) which put together the title (attributes, such as the number of the speech information contained in it and subimage information, and a specification, correspondence language, are the same) (one work which manufacturers, such as a movie, are going to show to a viewer) relevant to VTS here. UDF (Universal Disk Format)2 which has the information which manages the format to the file immediately recorded by the periphery in the disk concerned of the lead-in groove area LI is recorded, and VMG (Video Manager)3 is recorded following it. This information recorded as VMG3 is the whole image information and the speech information which are recorded on the videos DVD 1 concerned, such as a menu in which the selections to a user are shown, and an access table for accessing the information for illegal copy prevention, or each title, management information.

[0052] VTS4 of 1 is divided and recorded on two or more VOB(Video OBject) 10 which has an ID number in each by making VTSI (Video Title Set Information)11 into a head. Here, the part constituted

by two or more VOB10 is called VOB set (VOBS).
[0053] Information, such as PGCI (Program Chain Information) which are the various information about the program chain which is the logical partition which combined two or more cels (it mentions later about a cel.), is recorded on VTSI11 recorded on the head of VTS4. Moreover, the stereo parts of image information and speech information are recorded on each VOB10.
[0054] VOB10 of 1 is constituted by two or more cels 20 which have an ID number in each. The cel 20 of 1 is constituted by two or more VOB units (VOBU) 30 which have an ID number in each. Here, VOBU30 is one unit constituted by only either or the below-mentioned Navi-pack of image information, speech information, and subimage information (the information on subimages, such as a title in a movie, is said.).
[0055] VOBU30 of 1 is constituted by Navi-pack 41 in which the control information which makes a controlled system image information included in VOBU30 is stored, the video pack 42 containing the video data as image information, the audio pack 43 containing the audio data as speech information, and the subpicture pack 44 containing the subpicture data as subimage information. Here, only image data are recorded as a video data and only voice data is recorded as audio data. Moreover, as subpicture data, only graphical data, such as an alphabetic character as a subimage and a graphic form, are recorded.
[0056] The read-out initiation time information called SCR (System Clock Reference) which shows the read-out start time on the playback time-axis which should read the data contained in each pack P from the track buffer in the below-mentioned regenerative apparatus, and should start the input to each buffer, the start code which shows that it is initiation of Pack P are recorded on the pack header recorded on the head of each pack P.
[0057] Navi-pack 41 is constituted by the PCI (Presentation Control Information) data 50 which are the information about the playback display control at the time of indicating [voice / which was searched based on the DSI (Data Search Information) data 51 which are the retrieval information (address on DVD1 with which image concerned or voice etc. it indicates / voice / by playback is specifically recorded etc.) for searching an image or voice etc. it indicates / voice / by playback, and the DSI data 51 / the image or the voice] by playback.
[0058] All the video packs 42 included in VOBU30 of 1 are constituted by 1 or two or more GOP(s) (Group Of Picture). Above GOP is the minimum image unit refreshable [independent / which is defined in the specification of the MPEG 2 (Moving Picture Experts Group 2) method which is a picture compression method adopted in case image information is recorded on DVD1 in the gestalt of this operation].
[0059] Each partition carries out a partition setup and the manufacturer (only henceforth a manufacturer) of recording information who makes it record in DVD1 makes it record free according to the intention in a record format of the layered structure shown in drawing 1 explained above. By reproducing based on the below-mentioned logical structure for every partitions of these, it becomes reproducible [the versatility which was rich in change].
[0060] (1.2) Explain a logical format, next the logical format (logical structure) which combined the information recorded by the physical partition shown in drawing 1 using drawing 2 . In addition, the playback control information (access information or hour entry) for reproducing the logical structure shown in drawing 2 combining each data (especially cel 20) shown in drawing 1 by the logical structure which information is not actually recorded on DVD1 with the structure, and is shown in drawing 2 is the things on DVD1 currently recorded especially in VTSI11.
[0061] For convenience, when it explains from the hierarchy of the low order of drawing 2 , the program 60 of 1 is constituted on logic by choosing and combining two or more cels 20 among the physical structures of explanation explained in above-mentioned drawing 1 . In addition, a manufacturer can also give a definition as a smallest unit which a viewer can choose freely 1 or the summarized thing, and can view and listen to this program 60, and this unit is called PTT (Part of Title).
[0062] Here, about the number of the cel 20 of 1, in case it is dealt with as a cel ID number in case the cel 20 concerned is dealt with in the physical format shown in drawing 1 (it is indicated as cel ID# among drawing 1 .), and it is dealt with in the logical format shown in drawing 2 , it is dealt with as a cel

number in order of the description in the below-mentioned PGCI.
[0063] Two or more programs 60 are combined and PGC (Program Chain)61 of 1 is constituted on logic. PGCI mentioned above is defined by this unit of PGC61, and the number of the address which is a record location on the playback sequence (the program number of a proper is assigned every program 60 by this playback sequence.) of the cel 20 for every program 60 at the time of reproducing each program 60 and DVD1 of each cel 20, and the head cel 20 in the program 60 of 1 which should be reproduced etc. is contained in the PGCI concerned.
[0064] Besides Above PGCI, data, such as an ontic image and voice, will be contained in PGC61 of 1 noting that a program 60 should put together (if it puts in another way, noting that a cel 20 should put together).
[0065] The title 62 of 1 is constituted on logic by 1 or two or more PGC61. This title 62 will be a unit equivalent to one movie, if it says for example, for image information, and it is completed information which a manufacturer offers to the viewer of DVD1.
[0066] VTS63 of 1 is constituted on logic by 1 or two or more titles 62.
[0067] The information equivalent to VTS63 of 1 shown in drawing 2 is equivalent to the information included in VTS4 of 1 shown in drawing 1 . That is, in VTS63 shown in DVD1 at drawing 2 , all the information included on logic will collect as VTS4 of 1, and will be recorded.
[0068] When a manufacturer specifies the information classified in the physical structure based on the logical format explained above, an outstanding image or music is formed for a viewer.
[0069] (2) A DVD audio format, next audio information (music and speech information are also included.) Hereafter, the record format on the audio [being the same] DVD (physical record format) is explained using drawing 3 .
[0070] (2.1) Explain the physical format on Audio DVD (physical record format) at the beginning of a physical format using drawing 3 .
[0071] First, as shown in drawing 3 , the audio DVD 200 of an operation gestalt has the lead-out area LO in the outermost periphery while having the lead-in groove area LI in the most-inner-circumference section, and serves as a volume space of 1 in the meantime. Into this, an audio zone is surely recorded. Speech information is divided and recorded on each by two or more ATS (Audio Title Set)203 (ATS#1 - ATS#n) which has ID (discernment) number in this audio zone. SAPPT (Simple Audio Play Pointer Table)204 as playback control information for simple playbacks (two-channel playback etc.) is recorded on the head of an audio zone. This SAPPT is recorded on all the DVD disks that have an audio zone. In addition, SAPPT204 may be recorded into the lead-in groove area LI or below-mentioned AMG202.
[0072] UDF (Universal Disk Format)201 which has the information which manages the format to the file immediately recorded by the periphery section in the disk concerned of the lead-in groove area LI is recorded, SAPPT204 is recorded following UDF201, and AMG (Audio Manager)202 is recorded continuously. However, arrangement of the file of UDF201, SAPPT204, and others is not having to be this order.
[0073] The information recorded on this SAPPT204 is information required to reproduce LPCM data by 2ch(es). Moreover, the information recorded as AMG202 is the whole speech information currently recorded on the audios DVD 200 concerned, such as a menu for demanding item selection from a user, and an access table for accessing the information for illegal copy prevention, or each title, management information.
[0074] ATS203 of 1 consists of two or more AOB(Audio Object) 210 which has an ID number in each by making ATSI (Audio Title Set Information)211 into a head.
[0075] Here, the part constituted by two or more AOB210 is called AOB set (AOBS). This AOB set is the stereo part of speech information.
[0076] Information, such as APGCI (Audio Program Chain Information) as playback control information which is the various information about the program chain which is the logical partition which combined two or more cels (it mentions later about a cel.), is recorded on ATSI211 recorded on the head of ATS203. Moreover, the stereo part of speech information is recorded on each AOB210. AOB210 of 1 is constituted by two or more cels 220 which have an ID number in each.

[0077] The cel 220 of 1 is constituted by two or more audio packs 230 pack-ized, respectively, or an audio pack and the real-time information pack (Real Time Information Pack) 231. The audio information which the audio pack 230 pack-ized speech information which should be recorded on Audio DVD for every predetermined magnitude, for example, was digitized by Linear PCM etc. is included. Text information, BPM (Beat Per Minutes), ******, etc. are contained in the real-time information pack 231.
[0078] In a record format of the layered structure shown in drawing 3 explained above, according to the intention, free, the manufacturer (only henceforth a manufacturer) of recording information who makes it record in an audio DVD 200 does a partition setup, and, as for each partition, can record. By reproducing based on the below-mentioned logical structure for every partitions of these, it becomes reproducible [the versatility which was rich in change].
[0079] (2.2) Explain a logical format, next the logical format (logical structure) which combined the information recorded by the physical partition shown in drawing 3 using drawing 4 .
[0080] In addition, as for the logical structure shown in drawing 4 , information is not actually recorded on the audio DVD 200 with the structure. On Audio DVD, speech information is recorded in the physical format shown in drawing 3 to the last, and the information for reproducing this speech information is the logical format shown in drawing 4 , and is recorded on SAPPT204, AMG202, and ATSI211 which were mentioned above.
[0081] If it explains from the hierarchy of the low order of the expedient above figure 4 of explanation, an index 259 is constituted by choosing the cel or two or more cels 220 of one, and combining them among the physical structures explained in above-mentioned drawing 3 . An index can be used also as a tune number and is the minimum accessible unit by the user.
[0082] The truck 260 of 1 is constituted by 1 or two or more indexes 259 on logic. This truck 260 is an information unit equivalent to one music. A user can choose the truck (music) of arbitration and can access direct.
[0083] Here, about the number of the cel 220 of 1, in case it is dealt with as a cel ID number in case the cel 220 concerned is dealt with in the physical format shown in drawing 3 (it is indicated as cel ID# among drawing 3 .), and it is dealt with in the logical format shown in drawing 4 , it is dealt with as a cel number in order of the description in the below-mentioned APGCI.
[0084] A truck 260 (music) is an information unit containing two or more cels, and is a set of a cel which has a certain common attribute etc. That is, all of the attribute of all the cels in a truck are the same. Moreover, all the cels contained on a truck are adjacently recorded in the same object.
[0085] 1 or two or more trucks 260 are combined, and the title 261 of 1 is constituted on logic. However, this title itself is not recognized as a unit of access from a user. Therefore, a title number cannot be specified and the title of arbitration cannot be accessed.
[0086] Audio DVD can define independently the attribute of each truck 260 which constitutes a title 261 in a maximum of 8 pattern. That is, attributes as speech information, such as the number of channels, the quantization approach, and a sampling frequency, may be changed into each truck (music) of every.
[0087] APGCI mentioned above is defined by the unit of this title 261, and the number of the address which is a record location on the playback sequence of the cel 220 for every truck 260 at the time of reproducing the attribute of each truck and each truck 260 and the audio DVD 200 of each cel 220, and the head cel 220 in the truck 260 of 1 which should be reproduced, the playback system of each truck 260, and various commands are contained in the APGCI concerned.
[0088] Besides Above APGCI, ontic speech information will be contained in the title 261 of 1 noting that a truck (music) 260 should put together (if it puts in another way, noting that a cel 220 should put together).
[0089] The title group 262 of 1 is constituted on logic by 1 or two or more titles 261. Moreover, the title group 262 is the greatest unit which a user can access, and can give a definition to a maximum of nine pieces among 1 volume. This title group 262 is constituted by 1 or two or more titles 261 which gathered based on a certain fixed relevance, and all the titles in a title group are reproduced continuously. For example, music's collection of a certain singer and a composer etc. can be gathered as

one title group.
[0090] The volume 263 of 1 is constituted on logic by 1 or two or more title groups 262. This volume 263 is an information unit equivalent to the album (DVD) of one sheet.
[0091] The actual speech information contained in the title of 1 shown in drawing 4 will be recorded on Audio DVD in any 1 ATS203 shown in drawing 3 .
[0092] When a manufacturer specifies the information classified in the physical structure based on the logical format explained above, the music which a viewer listens to is formed.
[0093] (3) Explain the class of disk in the class of DVD, next DVD. In addition, in the following explanation, the information which contains both an image and voice like a movie may be called "AV information" about the information recorded on DVD, and the information only on the image part is called "video (or image) information." Moreover, the information only on speech information [like music] only whose voice part of AV information, such as a movie, is is called "audio (or voice) information."
[0094] moreover, as a DVD player which plays these DVD disks of various kinds of The video DVD player which can reproduce AV information by DVD video format (it is hereafter called a "video player".) The audio DVD player which reproduces the audio information by DVD audio format with various playback gestalten (it is hereafter called an "audio player".) The simple audio DVD player which reproduces the LPCM audio information by DVD audio format by 2ch(es) (it is hereafter called a "simple audio player".) And both AV information on a DVD video format and the audio information on a DVD audio format have four kinds of refreshable compatible DVD players (it is hereafter called a "compatible player".). Each DVD player is explained to a detail later.
[0095] As a DVD which records AV information or audio information, Video DVD, the video DVD with audio navigation, audio-only DVD, and four kinds of disks both for [DVD] an audio video exist. The physical format of four kinds of DVDs is roughly shown in drawing 5 .
[0096] In addition, all of a disk configuration or information recording methods (the modulation approach, a track pitch, pit size, etc.) of these DVDs are the same, and the informational contents (contents) only differ.
[0097] (3.1) Video DVD shows video DVD drawing 5 to the maximum upper case. The audio information (namely, AV information) reproduced by video information, such as a movie according to a DVD video format, and it and coincidence is recorded on this disk. Therefore, only a video zone exists in the record section between the lead-in groove area LI and the lead-out area LO, but playback control information, video information, and audio information are included and recorded on two or more VTS (s), and VMG containing the management information of them VTS is recorded on it. As explained with reference to drawing 1 , video information is recorded as a video pack and audio information is recorded as an audio pack.
[0098] This video DVD is navigation information (information which specifies the control information for playback.) included in the management information currently recorded on VMG. It explains in full detail behind. It is based and a video player and a compatible pull player are reproduced. However, since the navigation information by DVD audio format is not recorded, in an audio player, it is unreproducible.
[0099] (3.2) A kind of the videodisk called the video DVD with audio navigation shows the 2nd step of video DVD with audio navigation. It is the disk which is an audio player and made it possible to reproduce only the audio information on AV information on VOB in VTS by having recorded the navigation information by DVD audio format in addition to playback of video information (the accompanying audio information is included), such as a movie by DVD video format, being possible for this video DVD with audio navigation at a video player. Moreover, the part of AV information which can reproduce only audio information by the audio player is called audio play PERT.
[0100] The record gestalt of the video DVD with audio navigation is recorded with the gestalt of VTS of plurality [information / AV] in the video zone based on the DVD video format shown in drawing 1 . In addition, ATSI including playback control information required in order that the video DVD with audio navigation may reproduce only the audio information in VTS based on the DVD audio format ahead of

the video zone as an audio zone is recorded as ATS, and AMG as management information of ATS is recorded. In ATS, AOB which is the stereo part of audio information is not recorded. That is, the navigation information for reproducing the audio information (specifically every audio PUREIPATO audio pack in VOB (referring to drawing 1)) included in each VTS in the video DVD with audio navigation by the audio player is described by this AMG and ATSI.
[0101] Moreover, SAPPT is recorded on the head of an audio zone. The navigation information for reproducing the LPCM audio information included in VTS by 2ch(es) is described by this SAPPT.
[0102] This video DVD with audio navigation is played by the video player and the compatible player based on the navigation information currently recorded on VMG. Moreover, based on the navigation information currently recorded in AMG, audio play PERT's audio information is reproduced with various playback gestalten according to the capacity of a player by the audio player. Moreover, based on the navigation information currently recorded on SAPPT, audio play PERT's LPCM information is reproduced by 2ch(es) by the simple audio player.
[0103] (3.3) It is audio-only DVD which is shown in the 3rd step of audio-only DVD. Except for the static image and text information on some, only audio information is recorded on this disk. Therefore, only an audio zone exists in the record section between the lead-in groove area LI and the lead-out area LO, but ATSI and AOB are recorded on it as two or more ATS, and AMG containing the management information of these ATS is recorded on it. Furthermore, SAPPT is recorded on the lead-in groove area LI or an audio zone.
[0104] Moreover, each ATS contains 1 or two or more AOB(s) which are the stereo parts of audio information. Based on the navigation information by which this audio-only DVD is recorded on AMG, the audio information in an audio zone is reproduced with various playback gestalten according to the capacity of a player by the audio player and the compatible player. Moreover, based on the navigation information currently recorded on SAPPT, the LPCM information in an audio zone is reproduced by 2ch (es) by the simple audio player. However, since the navigation information by DVD video format is not recorded, in a video player, it is unreproducible.
[0105] (3.4) It is called the audio video two ways DVD to be shown in the bottom of DVD drawing 5 both for an audio video. An audio zone and a video zone are between the lead-in groove area LI and Lead-out LO. Based on the DVD video format, VTS including VMG, playback control information, and AV information (VOB) as a stereo is recorded on the video zone like Video DVD. SAPPT is recorded on the lead-in groove area LI or an audio zone.
[0106] Based on a DVD audio format, two or more ATS (1 drawing ATS# # 2) including SAPPT, AMG, playback control information, and the audio information as a stereo is recorded on an audio zone like audio-only DVD. Furthermore, ATS (drawing ATS# 3) only including the playback control information for reproducing only the audio information on VOB in VTS of a video zone is also recorded. That is, in the audio video two ways DVD, AV information by DVD video format and the audio information by DVD audio format are recorded on a separate field.
[0107] AMG not only contains the management information of all ATS in an audio zone, but in the case of both for [DVD] an audio video, be involved all ATS and VTS(s) in an audio zone and a video zone -- ********** is included. moreover, SAPPT should also be involved all ATS and VTS(s) in an audio zone and a video zone -- ********** is included. However, the management information is related with LPCM data reproducible by 2ch(es) of both zones.
[0108] here, the point that the point that the audio video two ways DVD differ from a videodisk with audio navigation and audio-only DVD is classified into an audio zone and a video zone, the record section of a disk boils it, respectively, and AV information by DVD video format and the audio information by DVD audio format are recorded, AMG recorded on an audio zone, and SAPPT should be involved all ATS and VTS(s) in a disk -- it is the point that ********** is included.
[0109] If it explains in more detail, based on the DVD video format, in VOB, multiplex [of the audio information] is carried out to video information per pack, and it is recorded on the videodisk with audio navigation. And ATS is constituted as ATSI and APGCI which is the playback control information for reproducing the audio information recorded in VOB manages only such ATS by AMG. The

management information of the title in a video zone is not recorded on AMG. The navigation information about the audio play PERT of a video zone is similarly described by SAPPT.
[0110] On the other hand, with the audio video two ways DVD, the field where the audio information by DVD audio format and AV information by DVD video format are recorded exists separately. The stereo part of audio information is recorded on each ATS as two or more AOB(s) by the DVD audio format shown in the audio zone at drawing 3 . Furthermore, two kinds of ATS of ATS (audio stereo information is in a video field, and only ATSI which is navigation information exists as ATS.) recorded in ATSI by setting to APGCI playback control information of the audio information recorded on VOB in VTS of not only ATS that recorded in ATSI APGCI which is the playback control information of the audio information in each ATS but a video zone is recorded. That is, it is not concerned with a zone but ATS is managed by AMG for all the playback control information in connection with playback of audio information. Furthermore, the information about a truck reproducible by 2ch among the playback control information in connection with playback of the LPCM audio information currently recorded on all ATS and VTS(s) is recorded on SAPPT.
[0111] On the other hand, AV information was recorded as two or more VTS(s), and the inside of a video zone was further recorded in VTSI by having set playback control information of AV information in each VTS to PGCI, and has managed all these VTS(s) by VMG. On the other hand, AMG has also managed all the playback control information about AV information playback of a video zone.
[0112] In the case of audio-only DVD and both for [DVD] an audio video, AMG serves as comprehensive management information, and, specifically, in the case of Video DVD, VMG becomes with main management information. In the case of the video DVD with audio navigation, AMG has managed only about playback of only the audio information in VOB by the audio player, and management of a video title is not performed.
[0113] Moreover, in the case of audio-only DVD and both for [DVD] an audio video, SAPPT becomes with the comprehensive management information for reproducing LPCM audio information by 2ch(es) by the short form, a portable mold audio player, etc. In order that there may be no SAPPT, even if it is recorded by LPCM in the case of Video DVD, only audio information by the simple player is not reproduced. In the case of the video DVD with audio navigation, SAPPT has managed only about playback of the LPCM audio information (audio-only title) of the audio play PERT in VOB by the simple audio player, and management of a video title is not performed.
[0114] taking such structure -- the capacity of a regenerative apparatus -- responding -- the optimal playback -- it can do -- in addition -- and compatibility which is adjustable between each disk and each regenerative apparatus is realized.
[0115] (4) Explain in more detail about playback control of a title, next playback control of a title. Here, a title points out some of a series of works with the common playback gestalt which consists of stereo information recorded on DVD, such as AV information and audio information, and playback control information which shows the playback procedure (presentation), or works. As the physics and the logical format of Audio DVD described, a user does not direct to choose a direct title and to start playback to a player. A user chooses one or the title group who consists of two or more titles, and starts playback. However, the title group is reproduced by reproducing each title for what kind of titles the title group in whom the player was directed consists of continuously, judging from the navigation information in AMG and ATSI. Therefore, in a DVD player, playback of a title is to a base. Then, the disk both for an audio video is explained to an example about playback control of the title in a DVD audio format, and a title.
[0116] (4.1) the kinds of a title -- the title (title 261 of drawing 4) in a DVD audio format is first classified into the audio title (henceforth referred to also as "AOTT (Audio Only TiTle)") constituted by playback of the speech information in an audio range, and the video title constituted by playback of AV information in a video field. Moreover, a video title is classified into two kinds, the title only for images (henceforth referred to also as "AVTT (Audio Video TiTle)"), and the title both for image voice (it is also henceforth called "AVTT/AOTT (Audio Video TiTle/Audio Only TiTle)"). In addition, in a DVD video format, it is only a title only for images.

[0117] AOTT is a title by which only audio information is reproduced and the stereo information is constituted by the audio information recorded on AOB in an audio zone.
[0118] AVTT is a title by which audio information is surely reproduced with video information, and the stereo information is constituted by AV information recorded on VOB in a video zone. In AVTT, playback of only audio information is not accepted but reproducing with video information becomes indispensable.
[0119] Also when only audio information is the title (that is, it can be called the title in two ways) which can also be reproduced and can also reproduce audio information with video information as AV information and AVTT/AOTT is any, the stereo information is constituted by AV information recorded on VOB in a video zone.
[0120] It is dependent on the capacity of a regenerative apparatus as which of AV information and audio information this AVTT/AOTT is reproduced. That is, with the regenerative apparatus (audio player) which does not have the ability to regenerate of AV information, AVTT/AOTT is reproduced only for audio information and AVTT/AOTT is reproduced with audio information with video information with the regenerative apparatus (a video player and compatible player) which has the ability to regenerate of AV information.
[0121] By the way, two navigation information, the navigation information for audio players and the navigation information for compatible players, is separately recorded on AMG. The navigation information for audio players is the audio-only TAITORUSACHI pointer which described the navigation information for reproducing only the speech information of the title in two ways constituted by AV information in VOB of the audio title (AOTT) constituted by the audio information in AOB of an audio zone, and a video zone, and this is recorded on an audio-only TAITORUSACHI pointer table (AOTT_SR). On the other hand, the refreshable audio title search pointer which is the navigation information for compatible players is recorded on an audio title search pointer table (ATT_SR) in the title of all classes. Such navigation information is further explained in full detail by explanation of drawing 8 .
[0122] In reproducing these audio video two ways DVD by the video player, according to the navigation information for video players currently recorded on VMG and VTSI in a video zone, it reproduces AV information in each VTS.
[0123] Moreover, in reproducing these audio video two ways DVD by the audio player, with reference to AOTT_SR in AMG in an audio zone, it reproduces audio information according to the playback control information for audio players currently recorded on ATSI. In reproducing audio information by the audio player, there are two cases. One is the case where the audio information in AOB is reproduced according to ATSI and APGCI which are AMG of an audio zone, and the navigation information in ATS, and another is the case where the audio information recorded on VTS in a video zone according to AMG and ATSI, and APGCI is reproduced like a videodisk with audio navigation. In the case of the latter, to the same object, in a video player, it reproduces as AV information accompanied by an image, and only audio information is reproduced by the audio player.
[0124] Furthermore, when reproducing these audio video two ways DVD by the compatible player, with reference to ATT_SR which is the navigation information for the compatible players in AMG in an audio zone, the audio information in an audio zone and AV information in a video zone are reproduced integrative according to the playback control information currently recorded on ATSI and VTSI.
[0125] All the titles in the audio video two ways DVD are managed by AMG, and are classified into either of the above-mentioned three kinds of a DVD audio format of titles. The case where the audio video two ways DVD which have the example of a logical format shown in drawing 6 using the compatible player which has the ability to regenerate of both a DVD audio format and a DVD video format are reproduced now is considered. In these audio video two ways DVD, volume shall consist of seven title groups of #1-#7, and each title group shall be constituted by one title. 1 or two or more trucks are included in one title. In drawing 6 , the navigation information (ATT_SR) for compatible pull players in a left column, the navigation information (TT_SR) for video players in a central train, and a right train show the image of the navigation information (AOTT_SR) for audio players.

[0126] Since title #2 and #5 are AOTT(s), at the time of playback of these titles, only the audio information recorded on AOB in the audio zone both for [DVD] an audio video is reproduced.
[0127] Since title #4, #6, and #7 are AVTT(s), AV information recorded in VOB in the video zone both for [DVD] an audio video is reproduced. Therefore, an image and voice will surely be reproduced.
[0128] Moreover, since title #1 and #3 are AVTT/AOTT, a compatible player reproduces both voice and an image based on the video and audio information which were recorded on VOB in the video zone of DVD both for an audio video. In addition, when the audio player which does not have the ability to regenerate of video information is used, in title #1 and #3, only the audio information recorded on VOB in the video zone both for [DVD] an audio video is reproduced (refer to the right column of drawing 6). That is, the AVTT/AOTT title is created so that recording information may be reproduced by the approach that the capacity can be demonstrated to the maximum extent, according to the capacity of the regenerative apparatus which is going to play the DVD disk concerned.
[0129] In addition, in order to lose the derangement at the time of title group playback, it is promised that AVTT cannot constitute other titles (AOTT, AVTT/AOTT) and title groups of a class.
[0130] (4.2) Explain the concept of PGCI specified about VOB in duplex management of VOB, next the video zone both for [DVD] an audio video, and APGCI. In VOB, it is recorded in the form where multiplex [of video information and the audio information] was carried out. When reproducing VOB as AV information, it will reproduce according to PGCI and this is the same concept as the case of Video DVD. Thus, since record of AV information in Audio DVD and the reproductive method were doubled with the video format, compatibility with a video player will be maintained. On the other hand, although it reproduces according to APGCI in reproducing only the audio information in VOB, this APGCI is specified independently of PGCI. This is explained with reference to drawing 7 .
[0131] Drawing 7 shows the concept of the program in the case where one certain VOB is reproduced as AV information according to PGCI, and the case of reproducing only as audio information according to APGCI. In drawing 7 , a video data, SAPUPIKU tea data, and audio data are contained in VOB. When reproducing this VOB as AV information, that playback control is performed based on PGCI. The VOB concerned is divided into six video cel #1-#6, by video cel #1, video cel #2-#4 constitute video program #2, and video cel #6 constitute video program #3 for video program #1 from PGCI. When reproducing AV information with the video player and compatible player like AVTT/AOTT, playback is performed according to such PGCI.
[0132] On the other hand, when an audio player reproduces only audio information from the same VOB, playback is performed according to APGCI. The audio program specified by APGCI is constituted by 1 or two or more audio cels, respectively. here, it comes out to the same object (VOB), and even if it is, it can be specified that an audio cel differs from a video cel (independently) (natural -- it is also possible to specify it be in agreement). That is, the starting position of each audio cel, a termination location, etc. can set up which video cel independently. Moreover, the playback sequence of the audio cel specified by APGCI can be specified independently of the playback sequence of the video cel specified by PGCI.
[0133] Audio program #1 is constituted by audio cel #1 and #2, and audio program #2 are constituted from an example of drawing 7 by audio cel #3. APGCI includes information, such as a record location of the audio cel contained in these audio program, and playback sequence, and playback of audio information is performed based on this.
[0134] Thus, the reason which enabled it to specify an audio cel independently of a video cel is for managing audio information independently of AV information. By carrying out like this, when reproducing only the audio information in VOB, it becomes possible to perform time management etc. independently of AV information. Moreover, even if it reproduces only for audio information among the audio information included in AV information, it becomes reproducible [a meaningful part]. You may be giving a definition as the same cel, of course.
[0135] (4.3) Explain the playback of each above-mentioned title in a title search pointer, next the audio video two ways DVD which used the title search pointer with reference to drawing 6 and drawing 8 .
[0136] The example of the navigation information both for [DVD] an audio video is shown in drawing 8 . As mentioned above, the audio video two ways DVD have an audio zone according to the video zone

and DVD audio format according to a DVD video format. Refreshable information is with AV information (image information with voice), such as a movie, and audio information from the audio video two ways DVD. And when each information is reproduced by various players, the navigation information for making it neither derangement nor conflict arise is separately recorded on the top both for [DVD] an audio video corresponding to each player.

[0137] (4.3.1) In AMG, ATSI, and title search pointer table drawing 8 , the audio video two ways DVD have an audio zone and a video zone. An audio zone consists of AMG202, ATS#1, ATS#2, and ATS#3, ATS#1 consists of ATSI211 and AOB210, and ATS#3 consist of only ATSI(s)212. Moreover, a video zone consists of VMG3, VTS#1, and VTS#2, and VTS#1 consists of VTSI11 and VOB10.

[0138] AMG202 contains AMGI (AMG Information)240 which is the stereo part of navigation information. AMGI240 contains the AMGI management table 241 including the information on the file size of AMGI240, the record address, etc., the ATT search pointer table 242, and the AOTT search pointer table 243. ATT is the generic name of the title (AVTT/AOTT) both for image voice which consists of an audio-only title (AOTT) which consists of only audio information, a title (AVTT) only for images which consists of AV information, and AV information here.

[0139] Here, a search pointer is a pointer in which the record location on DVD of the playback control information (here, the thing of APGCI and PGCI is pointed out.) of each title is shown. As mentioned above, each title is constituted by stereo information, such as audio information and AV information, and the playback control information for reproducing combining those stereo information. This playback control information is recorded on ATSI in ATS, or VTSI in VTS. A search pointer is a pointer in which the record location in ATSI of the playback control information of each title or VTSI is shown. In addition, navigation information is the information for managing playback of each title, and is a concept which contains the above-mentioned search pointer with this operation gestalt.

[0140] The ATT search pointer table 242 is a table which described the navigation information in the case of reproducing each title both for [concerned / DVD] an audio video by the compatible player. On the other hand, the AOTT search pointer table 243 is a table which described the navigation information in the case of reproducing each title both for [concerned / DVD] an audio video by the audio player. Moreover, the number of the search pointers which the ATT search pointer table 242 and the AOTT search pointer table 243 correspond 1:1 times, and are described in an ATT search pointer table is in agreement with the number of all the titles contained in the audio video two ways DVD concerned. For example, if a total of seven titles are contained in the audio video two ways DVD concerned as shown in drawing 6 , the frame which the search pointer corresponding to the seven title is described in the ATT search pointer table 242, and is not concerned with the class of the title but describes seven search pointers also to the AOTT search pointer table 243 will be prepared. And the frame of each table supports 1:1.

[0141] (4.3.1.1) An ATT_SRP audio title search pointer (ATT_SRP) is navigation information used in case the audio video two ways DVD are reproduced by the compatible player. Therefore, if the audio video two ways DVD are set, a compatible player will reproduce each title with reference to this ATT_SRP.

[0142] The example of the navigation information shown in drawing 8 is equivalent to the example both for [DVD] an audio video shown in drawing 6 R> 6, and, for title #1 and #3, the title (AVTT/AOTT) both for image voice, title #2, and #5 are [an audio-only title (AOTT), title #4, #6, and #7] the titles (AVTT) only for images.

[0143] As already stated, three kinds of titles (AOTT, AVTT/AOTT, AVTT) are recordable on the audio video two ways DVD. Therefore, with the audio video two ways DVD, the search pointer about all three kinds of titles (AOTT, AVTT/AOTT, AVTT) is described by the ATT search pointer table 242 of AMG.

[0144] However, the title search pointer 245 actually written to the ATT search pointer table 242 of drawing 8 is only an audio-only TAITORUSACHI pointer (AOTT_SRP) or a title search pointer (AVTT_SRP) only for images, and the title search pointer about the title (AVTT/AOTT) both for image voice is described as a title search pointer (AVTT_SRP) only for images (parenthesis writing shows

actual description in the table of drawing 8). This is because there is no need of distinguishing the title (AVTT/AOTT) both for image voice and the title (AVTT) only for images for a compatible player. That is, it is because the compatible player has the ability to regenerate of a DVD video format, all the titles both for image voice are reproduced as AV information, so a navigation information top does not have the need of distinguishing from a video search pointer (AVTT_SRP), either. Therefore, all are described by format common as a title search pointer (AVTT_SRP) only for images for the title accompanied by playback of an image.

[0145] Therefore, so that it may turn out that the left column of drawing 6 and the audio title search pointer table 245 of drawing 8 are contrasted In the ATT search pointer table 242 which describes the navigation information for compatible players About the title only for images (6 title #4, 7), and the title both for image voice (1 title # 3), the title search pointer (AVTT_SRP) only for images is described. An AOTT search pointer (AOTT_SRP) is described about an audio-only title (2 title # 5). With reference to this table 242, as shown in the left column of drawing 6 , a compatible player reproduces title #1, and 3, 4, 6 and 7 as AV information, and reproduces title #2 and #5 as audio information.

[0146] (4.3.1.2) The navigation information for audio players is described by AOTT_SRP one side and the AOTT search pointer table 243. Therefore, a set both for [DVD] an audio video reproduces an audio player with reference to this AOTT search pointer table 243.

[0147] The search pointer about an audio title (AOTT) and the title (AVTT/AOTT) both for image voice is described by this table. Since an audio player does not have the ability to regenerate of AV information, description of the search pointer about the title (AVTT) only for images does not have the need. However, the search pointer actually written to this table is only an AOTT search pointer (AOTT_SRP). For an audio player, there is no need of distinguishing an audio title (AOTT) and the title (AVTT/AOTT) both for image voice that there should be only information about whether it is the title which can reproduce only voice. Therefore, on the audio-only TAITORUSACHI pointer table (AOTT_SRPT) 243, an audio title (AOTT) and the title (AVTT/AOTT) both for image voice are not distinguished, but all are described by format common as an AOTT search pointer (AOTT_SRP).

[0148] Therefore, although the title search pointer (AVTT_SRP) only for images is described within the above-mentioned ATT search pointer table 242 about the title (AVTT/AOTT) both for image voice, an audio-only TAITORUSACHI pointer (AOTT_SRP) will be described within the AOTT search pointer table 243.

[0149] In addition, about the title (AVTT) only for images, although only the frame which writes a title search pointer is prepared, ontic information is not described or the purport (audio playback cannot be performed) in which this title does not have AOTT_SRP is described. It is because the AOTT search pointer table 243 describes the navigation information for audio players and the audio player is impossible for playback of AV information. Therefore, an audio player judges that this title is unreproducible, and disregards this description.

[0150] With reference to the AOTT title search pointer table 243 described as mentioned above, an audio player performs playback shown in the right column of drawing 6 . Namely, title #4 only for images, and 6 and 7 are disregarded, and audio information is reproduced about title #1, and 2, 3 and 5.

[0151] (4.3.2) VMG, VTSI, and the title search pointer VMG3 contain VMGI (VMG Information) which is the stereo part of navigation information. VMGI contains the VMGI management table 250 including the information on the file size of VMGI, the record address, etc., and the title search pointer table (TT_SRPT) 251. The title search pointer table 251 is a table which described the navigation information about a video player. Therefore, a video player reproduces a title with reference to this title search pointer table (TT_SRPT) 251 according to the procedure for which it opted in the conventional video format. Therefore, it will be said that it is altogether described by the title search pointer table (TT_SRPT) 251 as TT_SRP, without distinguishing these two although a title here is two kinds, the title (AVTT/AOTT) both for image voice and the title (AVTT) only for images.

[0152] Thus, with the audio video two ways DVD, for an audio player, a video player, and each compatible player, the optimal navigation information is prepared and it is recording as three separate title search pointer tables. Thereby, the optimal playback can carry out according to the capacity of each

regenerative apparatus.
[0153] (4.4) Give ****** explanation further about the structure of a search pointer table, next the structure of a search pointer table.
[0154] (4.4.1) ATT_SRP, AOTT_SRP, and the TT_SRPATT search pointer table 242 contain the ATT search pointer information 244 including information, such as the number of ATT search pointers, and two or more ATT search pointers 245. In addition, in drawing 8 , the inside of the parenthesis of each ATT search pointer shows the class of search pointer actually indicated as the search pointer concerned. The search pointer written to have mentioned above to the ATT search pointer table 242 is either AOTT_SRP or AVTT_SRP.
[0155] The AOTT search pointer table 243 contains the AOTT search pointer information 246 which includes information, such as the number of AOTT search pointers, similarly, and two or more AOTT search pointers 247. In drawing 8 , the class of search pointer with which the inside of **** of each AOTT search pointer is also actually described as the search pointer concerned is shown. As mentioned above, all the search pointers written to an AOTT search pointer table are AOTT_SRP.
[0156] The location on each search pointer table of the ATT search pointer which specifies the same title, and an AOTT search pointer must be the same. That is, the ATT search pointer on the ATT search pointer table 242 and the AOTT search pointer on the AOTT search pointer table 243 correspond by 1:1, and ATT_SRP#1 and AOTT_SRP#1 specify the same title.
[0157] TT search pointer table 251 contains TT search pointer information 252 which includes information, such as the number of TT search pointers, similarly, and two or more TT search pointers 254.
[0158] Although the ATT search pointer 245 and the AOTT search pointer 247 correspond by 1:1, between both and TT search pointer, the correspondence relation of 1:1 does not necessarily exist. However, TT search pointer is the same as an ATT search pointer and an AOTT search pointer at the point that the playback procedure is shown by PGC which constitutes the target title logically being shown.
[0159] (4.5) Classify and explain these titles for every refreshable player with reference to the playback approach of each title next drawing 6 , and 8 about each playback approach of three kinds of titles recordable on the audio video two ways DVD.
[0160] (4.5.1) An audio player and a compatible player can reproduce the playback approach AOTT of an audio-only title (AOTT). AOTT is a title for audio information playback. Moreover, there are the following in the main playback gestalten (function) of an audio-only title which it is going to realize or have relation by this invention. However, a realizable playback gestalt is also included in playback by the audio player of the title (AVTT/AOTT) both for image voice.
[0161] Multichannel playback: In a DVD audio format, a maximum of 8 ch is possible for the LPCM audio information on a video zone. As a discrete multichannel, a maximum of 6 ch is possible. In this case, 11 patterns are possible for a setup of 13 pattern a total of 24 patterns from the combination of the part of a discrete multichannel, and the signal for 2ch playback to each channel again from that of the combination of a two three front + back + subwoofer. 21 patterns are possible for the LPCM audio information on an audio zone in the combination of a two three front + back + subwoofer to the six-channel [a maximum of] possibility of and each channel.
[0162] 2ch playback: Reproduce the LPCM audio information on 2 or less ches as it is. The multichannel LPCM audio information on playback and an audio zone carries out a down mix at 2ch(es) based on the down mix multiplier separately defined per truck, and the multichannel LPCM audio information on a video zone reproduces only 2 ch of CH0 and CH1 as 2ch(es).
[0163] Audio selection: DVD can define the audio information on two different playback gestalten as one title, and a user can choose with it. This function is called audio selection. Specifically, a user can choose the playback gestalt from which 2ch(es) and a multichannel differed to the same music. Moreover, the audio information on LPCM record and the audio information recorded by other coding methods (compression voice, 1-bit voice, etc.) can be chosen to the music same as selection of those other than 2ch(es) and a multichannel, and it can also be heard.

[0164] Audio coding mode (Linear PCM, DORUBI AC 3, an MPEG audio, DTS, SDDS): The class of coding method at the time of recording audio information is shown. LPCM currently used also for CD is known well. Others are one of the compression coding methods.
[0165] Multichannel type: The class of multichannel record of LPCM in a DVD audio format is shown. In Type 1, a setup is possible up to a maximum of 6 ch. each channel -- ** -- the relation of loudspeaker arrangement can also be set up in the combination of a two three front + back + subwoofer.
[0166] Channel assignment (the number of channels, loudspeaker arrangement): Relation with the number of channels, and each channel and output loudspeaker arrangement in the multichannel of LPCM and the relation between each channel and a channel group are shown. for example, when the signal of 3ch is recorded, CH1 by which CH0 is contained in the channel group 1 by the signal outputted from the Left Front speaker:forward left is contained in the channel group 1 by the signal outputted from the Right Front speaker:forward right -- it is shown that CH2 is the relation of being the signal outputted from Surround speaker:back and being contained in the channel group 2. As mentioned above, in Type 1, a multichannel type is possible for a setup of 21 patterns in the combination of a two three front + back + subwoofer, and it is shown which combination channel assignment information is among these 21 patterns.
[0167] Multi-stream: Although the stereo information on the audio recorded on the audio range in a DVD audio format is recorded as an only audio stream into AOB, into VOB, for every pack, multiplex [of the stereo information on the audio recorded on a video field] is carried out, and it is recorded with the stream of an image. Moreover, if VOB is within the limits of the limited transfer rate, it can carry out multiplex [of two or more audio streams]. For example, it is also possible to carry out multiplex [of 2 ch/LPCM audio stream, and the multichannel / LPCM audio stream], or to carry out multiplex [of 2 ch/LPCM audio stream and the AC-3 compression voice stream]. A user can choose two audio streams from which these playback gestalten differ by specifying the value of audio selection.
[0168] (4.5.1.1) In the case of an audio player, first, explain how an audio player reproduces AOTT. As mentioned above, refer only to AOTT_SRPT243 for an audio player as navigation information. Therefore, if it is going to reproduce title #2, with reference to AOTT_SRP#2, the ATS number (in this case, ATS#1) in which the title concerned is contained, and the title number within that ATS will be read (see drawing 8 and the pass shown by "P2A (1)"). Next, with reference to ATSI211 of corresponding ATS#1 (see drawing 8 and the pass shown by "P2A (2)"), A(Audio) PGCI to which the title concerned corresponds is read from the title number within previous ATS. Therefore, audio information is reproduced by reproducing the audio pack 43 in AOB210 according to APGCI specified by AOTT_SRP#2 at the time of playback (see drawing 8 and the pass shown by "P2A (3)").
[0169] (4.5.1.2) the case of a compatible player, next a compatible player reproduce AOTT -- give approach ****** explanation. Refer to ATT_SRPT242 for a compatible player as navigation information. Therefore, with reference to ATT_SRP#2, if it is going to reproduce title #2, since it is AOTT_SRP, it will recognize that the title concerned is AOTT. Henceforth, the ATS number (in this case, ATS#1) in which the title concerned is contained, and the title number within that ATS are read like an audio player (see the pass shown by drawing 8 and "P2C (1)"). Next, with reference to ATSI211 of corresponding ATS#1 (see the pass shown by drawing 8 and "P2C (2)"), APGCI to which the title concerned corresponds is read from the title number within previous ATS. Therefore, audio information is reproducible by reproducing the audio pack 43 in AOB210 according to APGCI specified by ATT_SRP#2 at the time of playback (see the pass shown by drawing 8 and "P2C (3)").
[0170] (4.5.2) The title only for images (AVTT)
Next, the reproductive pass of the title only for images is explained. The title only for images can reproduce a video player and a compatible player.
[0171] (4.5.2.1) In the case of a video player, a video player processes with reference to TT_SRPT (title search pointer table)251 according to the playback procedure of a video format as navigation information. Therefore, the title search pointer table 251 of VMG3 is referred to first. The description location of each title search pointer table 242 of a title which corresponds on audio navigation here, and the search pointer on 243, and the description location of the title search pointer on the title search

pointer table 251 of VMG3 do not need to support 1:1. That is, in the ATT search pointer table 242 of AMGI, and TT search pointer table 251 of VMGI, the contents and sequence can be defined independently. However, in order to avoid derangement, suppose that a frame is packed and described on TT search pointer table in principle in the title search pointer table 251 when there is no title corresponding to TT_SRP254 of VMGI. Therefore, title numbers may differ, as drawing 8 shows. That is, although seven titles exist in the audio video two ways DVD of the example shown in drawing 6 , since title #2 whose a video player is AOTT, and #5 are not reproduced, TT_SRP about the five remaining titles (title #1, #3, #4, #6, #7) which excluded these has been described in the title search pointer table 251. therefore, each title # which shows TT_SRP#1-#5 in the title search pointer table 251 to drawing 6 , respectively -- 1, #3, #4, #6, and #7 are supported.

[0172] TT_SRP254 shows PGC which constitutes the target title logically. Therefore, a video player reads the VTS number (in this case, VTS#1) in which the title concerned is contained, and the title number within that VTS from this search pointer (see drawing 8 and the pass shown by "P3V(1)"). Next, with reference to VTSI11 of corresponding VTS#1 (see drawing 8 and the pass shown by "P3V(2)"), PGCI to which the title concerned corresponds is read from the title number within previous VTS. Therefore, a video player acquires this PGCI and reproduces the title concerned as AV information using the video pack in VOB, an audio pack, etc. (see drawing 8 and the pass shown by "P3V(3)").

[0173] (4.5.2.2) Explain pass the case of a compatible player, next in case a compatible player reproduces the title (AVTT) only for images. Refer only to ATT_SRPT242 for a compatible player as navigation information. Therefore, with reference to these ATT_SRP#4, since it is AVTT_SRP, it recognizes that the title concerned is a title only for images. As mentioned above, it is not in agreement with the title number in a video player. However, as the video player read from TT_SRPT, henceforth, the VTS number (in this case, VTS#1) in which the title concerned is contained, and the title number within that VTS are read from ATT_SRP245 (see the pass shown by drawing 8 and "P4C (1)"). Next, with reference to VTSI11 of corresponding VTS#1 (see the pass shown by drawing 8 and "P4C (2)"), PGCI to which the title concerned corresponds is read from the title number within previous VTS. Therefore, a compatible player also acquires this PGCI and reproduces the title concerned as AV information using the video pack in VOB, an audio pack, etc. (see the pass shown by drawing 8 and "P4C (3)").

[0174] (4.5.2.3) Explain the case of an audio player, next the case of an audio player. Refer only to AOTT_SRPT243 for an audio player as navigation information. Therefore, although AOTT_SPR#4 are read, since it is written here that there is no corresponding AOTT, playback is stopped.

[0175] (4.5.3) In the case of the title (AVTT/AOTT) both for image voice, the title both for image voice is reproduced by the players of an audio player, a video player, and all compatible players. Therefore, it explains to this order.

[0176] (4.5.3.1) In the case of an audio player, first, explain how audio BUREYA reproduces the title both for image voice. Refer only to AOTT_SRPT243 for an audio player as navigation information. Therefore, with reference to AOTT_SRP#1, the ATS number (in this case, ATS#3) in which the title concerned is contained, and the title number within that ATS are read (see drawing 8 and the pass shown by "P1A (1)"). Next, with reference to ATSI212 of corresponding ATS#3 (see drawing 8 and the pass shown by "P1A (2)"), APGCI to which the title concerned corresponds is read from the title number within previous ATS. However, these ATS#3 show the playback procedure as opposed to VOB10 of VTS#1 in this APGCI, excluding the audio data as a stereo. Therefore, only audio information is reproduced by reproducing only the audio pack 43 in VOB10 according to this APGCI at the time of playback (see the pass shown by drawing 8 "P1A (3)").

[0177] (4.5.3.2) Explain the approach in which a video player carries out title playback both for image voice next in the case of a video player. As mentioned above, a video player is not concerned with the class of disk, but processes according to the playback procedure of a video format. Therefore, the title search pointer table 251 of VMG3 is referred to first. A title number here is #1 and is in agreement with the title number on audio navigation. Since future pass is the same as that of the case of (5.2.1), explanation is omitted. see drawing 8 and the pass shown by "P1V(1), (2), (3)")

(4.5.3.3) Explain the case of a compatible player, next how a compatible player reproduces the title both for image voice. Refer only to ATT_SRPT242 for a compatible player as navigation information. Therefore, with reference to this ATT_SRP#1, it recognizes that it is AVTT. Henceforth, as the video player read from TT_SRPT251, the VTS number (also in this case, it is VTS#1) in which the title concerned is contained, and the title number within that VTS are read from ATT_SRP245 (see the pass shown by drawing 8 and "P1C (1)"). Since future pass is the same as that of the case of a video player, explanation is omitted (see the pass shown by drawing 8 , "P1C (2), and P1C (3)).

[0178] As explained above, the conflict and derangement at the time of reproducing the title from which various playback gestalten differ by the various players from which the ability to regenerate differs can be lost by having the information which has the information which unifies them or it not only has the navigation information for videos, and the navigation information for audios, but associates them.

[0179] (5) As stated until now [of a title / management information], a user chooses the truck included a desired title group or there, and directs playback. A regenerative apparatus chooses automatically the title in which the title or the directed truck which constitutes the directed title group is included according to the capacity of a regenerative apparatus, and starts playback.

[0180] Furthermore, in the DVD audio format, when reproducing an audio title (AOTT) or the title (AVTT/AOTT) both for image voice by the audio player, it has the logical structure which can choose audio information. About the structure for realizing this function, that navigation information is first explained based on drawing 9 . Drawing 9 is the block diagram having shown in the detail the structure of ATS203 shown in drawing 3 or drawing 8 .

[0181] (5.1) ATSIATS203 consists of ATSI_BUP213 as AOTT_AOBS10' as ATSI211 as navigation information, and a settlement of audio stereo information (AOTT_AOB210), and backup of ATSI211, as mentioned above.

[0182] Moreover, ATSI211 consists of ATS_PGCIT271 which is ATSI_MAT270 as management information, and the table of playback control information, as shown in drawing 9 .

[0183] (5.1.1) Attribute information, a down mix multiplier, etc. about the address information and audio stereo information on various tables are described by ATSI_MAT270 of ATSI_MAT management information.

[0184] (5.1.1) The coding method, a sampling frequency, a quantifying bit number, the number of channels, a multichannel type, a channel assignment, etc. are described every AOTT_AOB210 about AOTT_AOB210 contained in AOTT_AOBS210' by attribute information attribute information. Thus, when AOTT_AOBS210' is in ATS203, two or more kinds of audio information serves as here where it is separately recorded by being divided into AOTT_AOBS210' as another AOTT_AOB210. Moreover, there is also a thing without AOTT_AOBS210' in ATS203, and the attribute information about the audio stream of VOB (AOTT_VOB and AVTT_VOB)10 recorded on the video zone is described by the attribute information in this case. Therefore, when two or more kinds of audio information is recorded on VOB10 by VOB as two or more streams, the stream number and its attribute information are described for every stream here.

[0185] (5.1.2) ATS_PGCITATS_PGCIT271 consists of a table 275 of the search pointer (ATS_PGCI_SRP) 275 for looking for the playback control information corresponding to ATS_PGCITI272 and the title which describe the information about the whole playback control table, and a table 274 of playback control information (ATS_PGCI) 276 themselves.

[0186] (5.1.2.1) In ATS_PGCI_SRP this invention, while recording two or more audio information that classes differ on a disk, in order to deal with it as the same work and the same music about audio information with the candidate for sound recording common as a principle, as shown in drawing 10 and drawing 11 , PGC300 as management information was introduced and two or more audio information that classes differ in one title 261 is connected. Although later mentioned about the detail of the management method of the audio information using this PGC300, in connecting two or more audio information that classes differ in one title 261, in this invention, it has the logical structure which blocked PGC300.

[0187] And the playback control information of the audio stereo information managed by this PGC300

is ATS_PGCI276, and the information for looking for ATS_PGCI276 corresponding to each title 621 is described by ATS_PGCI_SRP275. For example, it is described every ATS_PGCI276 whether the PGC300 is an entry. An entry is information which shows that it is PGC300 representing a PGC block. Moreover, relation (under a head and a block, the last) in a PGC block, a block type, the number of channels, a coding method, the starting address of ATS_PGCI276, etc. are described [whether the title number in ATS203 and the PGC block are formed, and] by ATS_PGCI_SRP275 again.
[0188] As mentioned above, at the time of title playback initiation, it has explained that it has an ATS number and an ATS title number by AOTT_SRP247 of AMG202, and corresponding ATS_PGCI276 is acquired, but when ATS_PGCI_SRP275 of corresponding ATS203 of a number is seen, the location where ATS_PGCI276 corresponding to an ATS title number is recorded is known.
[0189] Moreover, when two or more audio information supports one title, two or more ATS_PGCI_SRP275 with the same ATS title number will exist. In this case, it will judge in accordance with other information (a block type, the number of channels, coding method), optimal PGC300 will be chosen, and playback will be started.
[0190] 1.2.2) ATS_PGCI276 as playback control information corresponding to each title constitutes the list and the table following the table of an ATS_PGCI search pointer.
[0191] In this invention, in order to manage audio stereo information by PGC300, as shown in drawing 10 or drawing 11 , the partition information of a program 301 is used. A program 301 is information which classifies the cel 220 mentioned above in playback units, such as one etc. music, and is the information corresponding to a truck 260. Therefore, PGC300 corresponding to a title 261 will manage 1 or two or more programs 301, and this information is described by ATS_PGCI276.
[0192] One ATS_PGCI276 consists of table ATS_PGIT291 which collected the information (ATS_PGC_GI) 290 about the PGC300 whole, and the information about each program 301 which constitutes the PGC300, and table ATS_C_PBIT292 which collected the information about each cel 220 which constitutes a program 301 further.
[0193] (5.1.2.2.1) **s, such as a start address of each table which continues after the number of programs, the number of cels, PGC playback time amount, and this information, are described as information about this PGC300 whole by ATS_PGC_GIATS_PGC_GI290.
[0194] (5.1.2.2.2) Only in the number of programs, information ATS_PGI about this program 301 that constitutes PGC300 forms a list and table ATS_PGIT291 in order of the playback following ATS_PGITATS_PGC_GI290. Information, such as information for specifying the information for specifying the attribute of the information for continuation playback and the audio stereo information (AOB) which this program reproduces as one ATS_PGI, and a down mix multiplier, a cel number corresponding to a program head, Start PTS, and program playback time amount, is described.
[0195] With the information which specifies the attribute of this ATS_PGI, the detailed attribute information on this program can be acquired for the first time by specifying the attribute information on the audio stereo information mentioned above that it is written concretely in ATSI_MAT270, by the attribute number, and making both correspond. Since it is considering as the structure where this attribute number can be defined for every program, in the DVD audio format, it has the structure where an attribute can be changed for every music.
[0196] However, there is information about an attribute also in ATS_PGCI_SRP275. The attribute information described by ATS_PGCI_SRP275 is the information for choosing the audio stereo information that classes differ, and serves as description of only attribute information common to each program 301. Conversely, if it says, a coding method must be common in the flume which can set up an attribute freely by the program unit. Moreover, when a PGC block is constructed, it is necessary to protect limit of unifying them by 3 or more ches or all the programs 301 in PGC300 also unify the number of channels by 2 or less ches.
[0197] Moreover, the cel number corresponding to a program head shows with which cel 220 this program 301 corresponds.
[0198] (5.1.2.2.3) Only in the number of cels, information ATS_C_PBI about this cel that constitutes PGC300 forms list table ATS_C_PBIT292 in order of the playback following

ATS_C_PBITATS_PGIT291. As for one ATS_C_PBI, an index number, a cel type, a start address, the address, etc. are recorded. The address on the disk of the audio stereo information corresponding to a title 261 is known for the first time here.
[0199] For example, suppose that the 3rd music of the title group 262 with a user was directed. This title group 262 presupposes that it consists of one title 261. Acquisition of ATS_PGCI corresponding to a title 261 is as having mentioned above. Since it is the 3rd music, 3rd ATS_PGIT291 corresponding to program #3 is read, and head cel number #n in it is acquired. Since, as for the program 301 (#3), it turned out that it starts from a cel 220 (#n), n-th ATS_C_PBI will be read, the start address described here will be acquired, it will jump there, and playback of the 3rd music will be started.
[0200] (5.2) Explain how the audio information from which two or more classes differ is recorded in the record approach of audio information, next this operation gestalt.
[0201] As explanation of the physical structure of each audio disk described, AOB210 as audio stereo information and VOB10 as AV stereo information are contained in ATS203 and VTS3, respectively. The stereo information furthermore reproduced as an audio title is also called ********, AOTT_AOB, and AOTT_VOB. It is AOTT_AOBS and AOTT_VOBS which considered two or more AOTT_AOB and AOTT_VOB as one settlement, respectively.
[0202] Audio information from which two or more classes differ, It is classified into three kinds shown below concretely.
[0203] a. Two or more audio information that sound recording situations differ (for example, **, such as sound recording, sound recording in the binaural sound recording and hole front, the sound recording in S seats and one spot sound recording, and sound recording usually according to a multi-microphone)
b. Two or more audio information that coding methods differ (for example, **, such as LPCM, MPEG, Dolby AC-3 and SDDS, and DTS)
c. two or more audio information sound recording situations that playback gestalten (the number of channels is 2 or less ches or 3 ches or more) differ, a coding method, a playback gestalt, and ** -- it can decide independently, respectively. However, two or more audio information that the target classes differ here is audio information with the common candidate for sound recording in principle, and it should be treated as the same work (title) and the same music (truck). Two or more audio information that these classes differ is recorded by two kinds of different approaches on a disk.
[0204] (5.2.1) Even if it was the AOTT_VOBSDVD audio format with two or more audio streams, the recording method of audio information when image information follows was made into the same recording method as a DVD video format in order to take a DVD video format and transposition. So, when two or more audio information that classes differ with image information was recorded, we decided to carry out multiplex to the same stereo information (AOTT_VOB), and to record on it as another stream. As stated even in the place of a video format, image information and audio information are begun, subimage information etc. is defined by VOB10 as a respectively different stream, it is divided into it per pack (2048Bytes), respectively, multiplex is carried out to it in this unit, and it is recorded on a disk as one system stream.
[0205] As audio information, since a definition can be given to a maximum of eight kinds, it is recordable here as another stream with a stream number which is different in the audio information from which a class differs, respectively. When such a method of a recording method is taken, a DVD video format and transposition can be taken. Moreover, there is a merit that the class of audio information can be easily changed only by changing the stream which a regenerative apparatus processes at the time of playback. Furthermore, since it is recording on one stereo information when it sees as a video title, naturally it can treat as the same title and the same truck. Therefore, two or more different audio information, such as the number of channels, can be recorded appropriately, without giving derangement to a user.
[0206] However, the multiplex system of such a stream is unsuitable to an audio format. In a DVD disk, there is a limit that the sum total of the data transfer rate of all streams is indispensable at 10.08 or less Mbpses. Therefore, it cannot carry out multiplex [of the two streams as shown in the following table 1].

[0207]
[Table 1]

	Audio coding mode	fs	Qb	Number of Channel	Bit rate
Stream #1	LPCM	96k	24bit	2ch	4.608 Mbps
Stream #2	LPCM	48k	16bit	8ch	6.144 Mbps
Total					10.742 Mbps

[0208] In Audio DVD, since it is necessary to surely record incompressible LPCM voice, when a sampling frequency is high, or when there are many channels, the data transfer rate needed is high. Therefore, when audio information tends to be made into a subject and it is mainly going to record two or more incompressible LPCM voice, it can be said that the multiplex system of this stream is unsuitable.
[0209] Moreover, the function as an object for sound recording and adjustment with the studio device by which current use is carried out are thought as important for an audio format, and it is asked for especially the processing at the time of record being easy. If it will have the structure which makes a video stream the start like a DVD video format, and carries out multiplex [of the stream of two or more adjustable rates], management information must be placed into data. Moreover, it has structure which describes the address information about the data for several order minutes at this management information, and if it thinks as sound recording equipment, it is unrecordable on a disk in the data for several minutes of order not being assembled. Therefore, the problem that a simple sound recorder cannot be constituted is produced. Moreover, authoring equipment new in addition to a current studio device is needed. There is also a said problem.
[0210] (5.2.2) When only two or more block AOTT_AOBS audio information was recorded, we made to solve the above-mentioned trouble into the more important technical problem, and decided to take the structure searched for as an audio format. Then, we decided to record only one kind of audio stream on one stereo information (AOTT_AOB), and when two or more audio information that classes differ was recorded, we decided to dissociate and record on another area on a disk as another stereo information (AOTT_AOB). By doing in this way, if the data transfer rate of one audio information is 10.08 or less Mbpses, it will serve as structure recordable without limit. Moreover, if there is the audio information by the data of a fixed rate like incompressible LPCM in order to record only one kind of audio stream, it is not necessary to place management information into data, and the processing at the time of record will also become easy.
[0211] Moreover, there is also no need of it not being necessary to reproduce the audio information on 2ch(es) and the audio information on a multichannel to coincidence and, and switching in an instant not much. Therefore, although the processing accompanying the switch at the time of playback will become complicated when it dissociated and records on another stereo information, it can be said that it is not a big problem.
[0212] However, the structure which treats two or more stereo information as the same title in this case is needed. Moreover, it is necessary to also treat systematically the audio information recorded on AOTT_VOB as two or more streams by the same structure.
[0213] (5.3) audio selection -- although it roughly divides into the approach of recording two or more audio information that classes differ, as mentioned above and there are two approaches among them, it is alike, respectively, it sets and there is a problem. Then, by giving the following logical structures to playback control information, this invention solved the problem in each approach, and enabled suitable audio selection. Switching-two or more audio information that class which needs to be treated as same

title and which is recorded on area where it differs on disk differs from audio selection here ****.
[0214] first, in taking the approach of separating and recording on a disk two or more audio information that classes differ on another area as another stereo information (AOTT_AOB) As shown in drawing 10 , it is the recording method (in the case of drawing 10) of audio stereo information. Sound-recording gestalt: Two or more audio stereo information of each that 2ch differs from multi-ch (in this case, since it is an audio title) The cel 220 which constitutes each AOB210 is classified into the unit of the plug ram 301 as the 2nd partition unit to playback of AOTT_AOB210 (AOB#1, AOB#2). Moreover, each program 301 is identified with the program number (#1, #2, #3, --) as the 2nd partition information. In this program 301, it is a playback unit corresponding to a truck 260, for example, is equivalent to one music. Therefore, although recording methods differ, since the contents of each audio stereo information (AOTT_AOB210 (AOB#1, AOB#2)) are the same, the number and sequence of the program 301 about each audio stereo information become equal. In the case of drawing 10 R> 0, program #1, #2, and #3 will be consisted of, respectively.
[0215] Next, each program 301 (program #1, #2, #3) is summarized by blocked PGC300 (PGC#1, PGC#2) which is made into management information and which is each an exception. And the program 301 (program #1, #2, #3) including the audio stereo information that each recording methods differ is connected to the same truck 260 (#1) by making these PGC(s)300 (PGC#1, PGC#2) correspond to the same truck 261 (for it to be truck #1 in the case of drawing 10). That is, this invention is the audio stereo information on the program unit identified with the program number as the 2nd partition information. It is the truck 261 as the 1st partition unit identified in the audio stereo information that recording methods differ, respectively, with the track number (#1, #2, #3, --) as the 1st partition information. It has connected with the same truck 261 which has the same track number using separate PGC300 blocked as management information.
[0216] Two or more audio information that classes differ by doing in this way Even when taking the approach of separating and recording on another area on a disk as another stereo information (AOTT_AOB), from a user It is recognized as the same title and the same music, and two or more audio stereo information that classes differ can be systematically treated by choosing PGC300 which manages the audio stereo information on a recording method which suited directions of a user or the capacity of a regenerative apparatus.
[0217] next, in taking the approach of recording the audio stereo information that a recording method changes with stream multiplex system on the record section of a video format As [show / in drawing 11] Audio stereo information AOTT_VOB10 (in the case of drawing 11 , it is VOB#1) Separate PGC300 (in the case of drawing 11 , it is PGC#1 and #2) which was blocked and was prepared in each recording method (sound-recording gestalt: the case of drawing 11 2 ch and multi-ch) of every is used, and it is related ****** to the same truck 261 (in the case of drawing 11 , it is truck #1). In addition, each PGC300 of the point of managing a program 301 (it being program #1, #2, and #3 in the case of drawing 11) is the same as that of the case of drawing 10 .
[0218] The audio information on a desired recording method can be appropriately reproduced only by choosing PGC300 according to a recording method, without carrying out the direct reference of the navigation information in an audio stream, since the recording method of each audio stereo information is managed by each PGC300 by taking such the logical structure. That is, according to this invention, the audio information recorded in the video format is manageable by the control information of an audio format. Of course, from a user, it is recognized as the same title and the same music even in this case. Therefore, two or more audio information that classes differ can be systematically treated by choosing PGC which suited directions of a user or the capacity of a regenerative apparatus.
[0219] As mentioned above, audio selection can be performed by the structure same (when reproducing the title both for image voice) even when audio information is recorded on AOTT_AOB according to this invention, and even when recorded on AOTT_VOB (when reproducing an audio title), and this invention is effective when reproducing an audio title (AOTT) or the title (AVTT/AOTT) both for image voice by the audio player.
[0220] It explains how furthermore, this audio selection is performed in a concrete example using

drawing 12 and 13.
[0221] (5.3.1) Explain to the audio selection beginning in an audio title the case where an audio title is reproduced with an audio player or a compatible player. Here, all title groups shall consist of one title. A regenerative apparatus is only for 2ch(es), or suppose that it has set up so that a user may choose 2ch playback. Moreover, suppose that the user directed the title group's 262 (#j) rebirth.
[0222] As mentioned above, the ATS number and ATS title number of a title corresponding to the title group 262 acquire with reference to AOTT_SRP247 (refer to drawing 8). As a result, an ATS number presupposes that #2 and an ATS title number were #3. the case of an audio (4.5.1.1) player, and (4.5.1.2) in the case of a compatible player, the flow so far is as having come out and explained.
[0223] Next, ATSI211 of ATS#2 is read and the attribute information currently written to ATSI_MAT270 is memorized (see the pass shown by drawing 12 and "P12 (1)"). In this phase, the attribute of each truck of the title which it is going to reproduce cannot be specified. All attribute information is memorized for the time being.
[0224] Then, ATS_PGCIT271 is read and it goes the PGCI search pointer (ATS_PGCI_SRP) 273 in this to reading (see the pass shown by drawing 12 and "P12 (2)"). An ATS title number (ATS_TTN) looks for ATS_PGCI_SRP273 of #3 in this table. In this case, it turns out that ATS_PGCI_SRP273 of #3 constitutes [the ATS title number as the 1st partition information] those (#3 and #4) with two, and a PGC block. Then, it judges PGCwhich 300 is chosen. In this case, a regenerative apparatus is only for 2ch(es), or since it is set up so that a user may choose 2ch playback, a book type item is seen. the PGC block is constructed by the difference in the number of channels here -- since it is written -- a degree -- Audio PGC300 of the direction which sees the item 284 (refer to drawing 9 and drawing 12) of channels, and is written to be 2 or less ches is chosen. And the address (in this case, 16384) with which playback control information ATS_PGCI276 of selected PGC300 is written is acquired, it jumps there, and playback control information is read and memorized (see the pass shown by drawing 12 and "P12 (3)").
[0225] The information table about a program 301 corresponding to a truck 260 and the information table about a cel 220 are in playback control information. In starting playback from a title head, ATS_PGI of program #1 is seen, the attribute information previously remembered to be the information which specifies the attribute of program #1 is used, and it specifies the attribute of program #1. An audio decoder is set according to this attribute. Next, from ATS_PGI, the head cel number of program #1 is read (since it is program #1 that it is going to reproduce in this case, naturally that head cel number is also #1.), the address with which the cel 220 is recorded is read in ATS_C_PBI corresponding to that number, it jumps there, and playback is started (see the pass shown by drawing 12 and "P12 (4)").
[0226] Usually, in playback, playback of a cel is continued using ATS_C_PBI memorized by the memory under playback until it becomes the following program. If playback of a program finishes, using ATS_PGI and attribute information in memory, this will also perform a series of processings for the next program playback, and will start playback. This actuation is repeated till title termination. Therefore, as mentioned above, all the attribute information and playback control information ATS_PGCI in management information must be memorized.
[0227] next, a regenerative apparatus -- multichannel playback -- corresponding -- **** -- in addition -- and suppose that it has set up so that a user may choose multichannel playback. Moreover, suppose that the user directed the title group's 262 (#j) rebirth.
[0228] ATS number #2 of the title corresponding to the title group 262 and ATS title number #3 are acquired, and ATSI211 of ATS#2 is read and it goes. It is the same as the case where 2ch playback is chosen so far (see drawing 12 R> 2 and the pass shown by "P1M(1)"). Moreover, the attribute information currently written to ATSI_MAT270 of ATSI211 is memorized, ATS_PGCIT271 is read, and it goes the ATS_PGC search pointer 273 in this to reading (see drawing 12 and the pass shown by "P1M(2)"). There are not a case where the processing so far also chooses 2ch playback, and a change.
[0229] An ATS title number (ATS_TTN) looks for ATS_PGC_SRP273 of #3 in this table. In this case, it turns out that ATS_PGCI_SRP of #3 constitutes [the ATS title number] the PGC block with two (#3 and #4). Then, it judges PGCwhich 300 is chosen. in this case, a regenerative apparatus -- multichannel

playback -- corresponding -- **** -- in addition -- and since it has set up so that a user may choose multichannel playback, a book type item is seen. Since it is written here that the PGC block is constructed by the difference in the number of channels, it is Audio next. PGC300 of the direction which sees the item 284 of channels and is written to be 3 or more ches is chosen. And the address (in this case, 24576) with which playback control information ATS_PGCI276 of selected PGC300 is written is acquired, it jumps there, and playback control information is read and memorized (see drawing 12 and the pass shown by "P1M(3)").

[0230] Future processings are fundamentally [as the case where 2ch playback is chosen] the same, except that PGC(s)300 to process differ and the stereo information to reproduce differs. ATS_PGI of program #1 is seen from the information table about the program in playback control information, the attribute of program #1 is specified, and an audio decoder is set. Next, ATS_C_PBI of head cel number #1 of program #1 is read, the address with which cel #1 is recorded is read in ATS_PGI, it jumps there, and playback is started (see drawing 1212 and the pass shown by "P1M(4)").

[0231] (5.3.2) Explain the case where the title both for audio selection image voice in the title both for image voice is reproduced by the audio player. Here, all the title groups 262 shall consist of one title. A regenerative apparatus is only for LPCM(s), or suppose that it has set up so that a user may choose playback of LPCM. Moreover, suppose that the user directed the title group's 262 (#j) rebirth.

[0232] As mentioned above, the ATS number and ATS title number of a title 261 corresponding to the title group 262 are acquired with reference to AOTT_SRP247. As a result, an ATS number presupposes that #2 and an ATS title number were #4. The flow so far is as having explained in the case of an audio (4.5.3.1) player.

[0233] Next, ATSI212 of ATS#2 is read and the attribute information currently written to ATSI_MAT270 is memorized (see drawing 13 and the pass shown by "P2L (1)"). In this phase, the attribute of each truck of the title which it is going to reproduce cannot be specified. All attribute information is memorized for the time being. Moreover, since it is going to reproduce the title both for image voice in this case, corresponding ATS203 is ATS of only navigation information without stereo information.

[0234] Then, ATS_PGCIT271 is read and it goes the PGCI search pointer 273 in this to reading (see drawing 13 and the pass shown by "P2L (2)"). An ATS title number (ATS_TTN) looks for ATS_PGCI_SRP273 of #4 in this table. In this case, it turns out that ATS_PGCI_SRP273 of #4 constitutes [the ATS title number] the PGC block with two (#4 and #5). Then, it judges PGCwhich 300 is chosen.

[0235] In this case, a regenerative apparatus is only for LPCM(s), or since it has set up so that a user may choose playback of LPCM, a BURROKU type item is seen. Since it is written here that the PGC block is constructed by the difference between the number of channels and a coding method, it is Audio next. coding PGC300 of the direction which sees the item 285 of mode and is written to be LPCM is chosen.

[0236] Next, the address (in this case, 24576) with which playback control information ATS_PGCI276 of selected PGC is written is acquired, it jumps there, and playback control information is read and memorized (see drawing 13 and the pass shown by "P2L (3)").

[0237] The information table about a program 301 corresponding to a truck 261 and the information table about a cel 220 are in playback control information. In starting playback from a title head, ATS_PGI of program #1 is seen and it specifies the attribute of program #1 using the attribute information previously remembered to be the information which specifies the attribute of program #1. An audio decoder is set according to this attribute. Next, from ATS_PGI, the head cel number of program #1 is read (since it is program #1 that it is going to reproduce in this case, naturally that head cel number is also #1.), the address with which the cel is recorded is read in ATS_C_PBI corresponding to that number, it jumps there, and playback is started (see drawing 13 and the pass shown by "P2L (4)").

[0238] Usually, in playback, playback of a cel is continued using ATS_C_PBI memorized by the memory under playback until it becomes the following program. If playback of a program finishes,

using ATS_PGI and attribute information in memory, this will also perform a series of processings for the next program playback, and will start playback. This actuation is repeated till title termination. Therefore, as mentioned above, all the attribute information and playback control information ATS_PGCI in management information must be memorized.
[0239] Next, the regenerative apparatus supports multichannel playback and AC-3 (a kind of a coding method: Dolby Digital), and suppose that it has set up so that a user may choose playback of AC-3. Moreover, suppose that the user directed the title group's 262 (#j) rebirth.
[0240] ATS number #2 of the title 261 corresponding to the title group 262 and ATS title number #4 are acquired, and ATSI211 of ATS#2 is read and it goes. It is the same as the case where LPCM playback is chosen so far (see drawing 13 and the pass shown by "P2A (1)"). Moreover, the attribute information currently written to ATS_MAT270 of ATSI211 is memorized, ATS_PGCIT271 is read, and it goes the ATS_PGC search pointer 273 in this to reading (see drawing 13 and the pass shown by "P2A (2)"). There are not a case where the processing so far also chooses LPCM playback, and a change.
[0241] An ATS title number (ATS_TTN) looks for PGC300 of #4 in this table. In this case, it turns out that PGC of #4 constitutes [the ATS title number] the PGC block with two. Then, it judges PGCwhich 300 is chosen.
[0242] In this case, the regenerative apparatus supports multichannel playback and AC-3, and since it has set up so that a user may choose playback of AC-3, a book type item is seen. the PGC block is constructed by the difference between the number of channels, and a coding method here -- since it is written -- a degree -- Audio coding PGC of the direction which sees the item 285 of mode and is written to be AC-3 is chosen. And the address (in this case, 32768) with which playback control information ATS_PGCI276 of selected PGC is written is acquired, it jumps there, and playback control information is read and memorized (see drawing 13 and the pass shown by "P2A (3)").
[0243] Future processings are fundamentally [as the case where LPCM playback is chosen] the same, except that PGC(s) to process differ and the streams to reproduce differ. ATS_PGI of program #1 is seen from the information table about the program in playback control information, the attribute of PG#1 is specified, and an audio decoder is set. Next, ATS_C_PBI of head cel number #1 of program #1 is read, the address with which cel #1 is recorded is read in ATS_PGI, it jumps there, and playback is started (see drawing 13 and the pass shown by "P2A (4)"). However, since the stereo information (AOTT VOB) reproduced in this case is the same, the address of a jump place also becomes the same as the case where playback of LPCM is chosen.
[0244] (6) As shown in regenerative-apparatus (6.1) video DVD player drawing 14 , the video DVD player concerning the gestalt of operation Pickup 80, the recovery correction section 81, and the stream switches 82 and 84, A track buffer 83, a system buffer 85, and a demultiplexer 86, The VBV (Video Buffer Verifier) buffer 87, The video decoder 88, the subpicture buffer 89, and the subpicture decoder 90, It is constituted by a mixer 91, the audio buffer 92, the audio decoder 93, the input section 98, a display 99, the system controller 100, the drive controller 101, the spindle motor 102, and the slider motor 103. In addition, the configuration shown in drawing 14 indicates only an image and the part about audio playback among the configurations of a video DVD player, and since the servo circuit for carrying out servo control of the slider motor 103 grade to pickup 80 and spindle motor 102 list etc. is the same as that of the conventional technique, a publication and details explanation are omitted.
[0245] Next, actuation is explained.
[0246] Pickup 80 receives the reflected light from DVD1 of the light beam B concerned, and outputs the detecting signal Sp corresponding to the information pit currently formed on DVD1 while it irradiates light beam B as a playback light to DVD1 including the laser diode which is not illustrated, a beam splitter, an objective lens, a photodetector, etc. While light beam B is correctly irradiated to the code track on DVD1 at this time, tracking servo control and focus servo control are performed by the same approach as the conventional technique to the objective lens which is not illustrated so that a focus may be correctly connected with the information recording surface on DVD1.
[0247] It is inputted into the recovery correction section 81, and recovery processing and error correction processing are performed, the recovery signal Sdm is generated, and the detecting signal Sp

outputted from pickup 80 is outputted to the stream switch 82 and a system buffer 85.
[0248] The stream switch 82 into which the recovery signal Sdm was inputted is the switch signal Ssw1 from the drive controller 101. The closing motion is controlled, and when it is close, through [of the inputted recovery signal Sdm] is carried out as it is, and it outputs to a track buffer 83. On the other hand, when the stream switch 82 is open, the recovery signal Sdm is not outputted and unnecessary information (signal) is not inputted into a track buffer 83.
[0249] The track buffer 83 into which the recovery signal Sdm is inputted outputs the memorized recovery signal Sdm continuously, when the stream switch 84 is made close, while being constituted by FIFO (First In First Out) memory etc. and memorizing the inputted recovery signal Sdm temporarily.
[0250] The stream switch 84 into which the recovery signal Sdm is inputted continuously is the switch signal Ssw2 from a system controller 100 so that various latter buffers may overflow, or it may become empty conversely and decoding may not be interrupted in the separation processing in a demultiplexer 86. Closing motion is controlled.
[0251] On the other hand, the system buffer 85 into which the recovery signal Sdm is inputted in parallel to a track buffer 83 the management information (VMG2 grade) about the whole information which is first detected when loading of DVD1 is carried out, and is recorded on DVD1, or VTS11 for every VTS3 -- accumulating -- control information Sc ******, while outputting to a system controller 100 The DSI data 51 for every Navi-pack 41 are temporarily stored during playback, and it outputs to a system controller 100 as control information Sc.
[0252] Through the stream switch 84, in the demultiplexer 86 inputted continuously, the recovery signal Sdm extracts a video data, audio data, subpicture data, and the PCI data for every Navi-pack from the recovery signal Sdm concerned for every pack, and outputs to the VBV buffer 87, the subpicture buffer 89, and the audio buffer 92 as a PCI signal Spc at a video signal Sv, the subvideo signal Ssp, and an audio signal Sad list, respectively.
[0253] At this time, a demultiplexer 86 extracts a pack header, a packet header, etc. from each pack (the audio pack 43 is included.) and a packet, and outputs them to a system controller 100 by making into the header signal Shd information included in each.
[0254] Video signal Sv It is constituted by the FIFO memory etc. and the VBV buffer 87 inputted is a video signal Sv. It accumulates temporarily and outputs to the video decoder 88. The VBV buffer 87 is the video signal Sv compressed by the MPEG 2 method. It is for compensating dispersion in the amount of data of each picture (refer to drawing 2) of every [which can be set]. And video signal Sv with which dispersion in the amount of data was compensated It is inputted into the video decoder 88, a recovery is performed by the MPEG 2 method, and it is outputted to a mixer 91 as a recovery video signal Svd.
[0255] On the other hand, the subpicture buffer 89 into which the subvideo signal Ssp is inputted accumulates the inputted subvideo signal Ssp temporarily, and outputs it to the subpicture decoder 90. The subpicture buffer 89 is for outputting the subpicture data 44 contained in the subvideo signal Ssp synchronizing with the video data 42 corresponding to the subpicture data 44 concerned. And the subvideo signal Ssp with which the synchronization with a video data 42 was taken is inputted into the subpicture decoder 90, a recovery is performed, and it is the recovery secondary video signal Sspd. It carries out and is outputted to a mixer 91.
[0256] It is mixed by the mixer 91 and the recovery secondary video signal Sspd (the synchronization with the corresponding recovery video signal Svd can be taken.) outputted from the recovery video signal Svd and the subpicture decoder 90 which were outputted from the video decoder 88 is outputted to displays, such as CRT (Cathod Ray Tube) which is not illustrated as a final video signal Svp which should be displayed.
[0257] The audio buffer 92 into which an audio signal Sad is inputted is constituted by the FIFO memory etc., accumulates the inputted audio signal Sad temporarily, and outputs it to the audio decoder 93. The audio buffer 92 is the video signal Sv including the image information which corresponds an audio signal Sad based on the header control signal Shc outputted from a system controller 100. Or an audio signal Sad is delayed according to the output situation of image information of being for making it

outputting synchronizing with the subvideo signal Ssp, and corresponding. And the audio signal Sad by which timing was carried out so that it might synchronize with corresponding image information is outputted to the loudspeaker which regeneration in a linear PCM system is given and is not illustrated as recovery audio signal Sadd based on the header control signal Shc which is outputted to the audio decoder 93 and outputted from a system controller 100. In addition, in the audio DVD only including music information, synchronous processing with image information is unnecessary.

[0258] (6.2) Explain an audio DVD player, next an above-mentioned audio DVD player with reference to drawing 15 . As shown in drawing 15 , an audio DVD player has the same configuration except it, although the configurations of the latter part of a demultiplexer 86 differ as compared with the video DVD player shown in drawing 14 . Therefore, the component after a demultiplexer 86 is explained.

[0259] Through the stream switch 84, in the demultiplexer 86 inputted continuously, the recovery signal Sdm extracts audio information from the recovery signal Sdm concerned for every pack, and outputs to the audio buffer 92 as an audio signal Sad.

[0260] The audio buffer 92 into which an audio signal Sad is inputted is constituted by the FIFO memory etc., accumulates the inputted audio signal Sad temporarily, and outputs it to the audio decoder 93. An audio signal Sad is inputted into the audio decoder 93, and is outputted to the loudspeaker which regeneration in a linear PCM system etc. is given and is not illustrated as recovery audio signal Sadd based on the control signal Shc outputted from a system controller 100.

[0261] For example, real-time information, such as a real-time text, is outputted to a RTI buffer from a demultiplexer. Based on the control signal Shc outputted from a system controller 100, the data temporarily stored in RTI Bachar are outputted to a RTI decoder, and display words etc. on the display which is not illustrated.

[0262] When it is detected that there is the need (a pause is carried out) of interrupting voice temporarily in the playback immediately after access to the information on desired etc., the pause signal Sca is outputted to the audio decoder 93 from a system controller 100, and the audio decoder 93 concerned suspends the output of recovery audio signal Sadd temporarily.

[0263] The configuration of the audio decoder 93 is shown in drawing 16 . The audio decoder 93 is equipped with the signal-processing section 120 containing a digital filter etc., D/A converter 121, the analog output circuit 122 containing amplifier etc., the digitized output circuit 123, the system microcomputer 124 containing RAM124a, and the clock circuit 125 like illustration.

[0264] The system microcomputer 124 exchanges a control signal Sca between system controllers 100, and performs motion control of the clock circuit 125, the signal-processing section 120, D/A converter 121, and the analog output circuit 122. The system microcomputer 124 has RAM124a inside. RAM124a memorizes temporarily the audio attribute information supplied as a control signal Sca from a system controller 100. The system microcomputer 124 supplies the contents to the clock circuit 125 and the signal-processing section 120 with reference to the audio attribute information memorized in RAM124a. Specifically, the system microcomputer 124 supplies the sampling frequency information in audio attribute information to the clock circuit 125. The clock circuit 125 has an oscillator and supplies the clock signal fs corresponding to the directed sampling frequency to the signal-processing section 120. Moreover, the system microcomputer 124 supplies the information on the existence of the sampling frequency in audio attribute information, a quantifying bit number, the number of channels, and emphasis to the signal-processing section 120, and offers the number information of channels to D/A converter 121. Furthermore, the system microcomputer 124 supplies information, such as amplification degree of the signal of each channel, to the analog output circuit 122. The information on the amplification degree for every channel can be included in audio attribute information, and can be supplied from a system controller 100.

[0265] The signal-processing section 120 uses the clock signal fs from the clock circuit 125, processes decode of the audio signal supplied from the audio buffer 92, a band limit, etc. according to information, such as coding methods (Linear PCM or DORUBI AC 3) obtained from the system microcomputer 124, a sampling frequency, and a quantifying bit number, further, performs de-emphasis processing according to the information on the existence of emphasis, and outputs it to D/A converter 121. D/A

converter 121 divides the inputted signal for every channel according to the channel information acquired from the system microcomputer 124, and outputs it to the analog output circuit 122 as an analog signal for every channel further. Moreover, the signal-processing section 120 outputs digital audio signal Sadd to the exterior through the digitized output circuit 123.
[0266] (6.3) Although a compatible DVD player compatible DVD player does not illustrate, it constitutes a system controller 100 so that playback of both a video format and an audio format may be possible, while it equips the audio DVD player shown in drawing 15 with the VBV buffer 87 in the video DVD player shown in drawing 14 , the video decoder 88, the subPIKUCHIA buffer 89, the subPIKUCHIA decoder 90, and a mixer 91.
[0267] (7) The audio selection in the audio selection regenerative apparatus in a regenerative apparatus means switching the class of audio information to reproduce, when an audio player reproduces an audio title or the title both for image voice.
[0268] As a class of audio information, it is the record approach of audio (5.2) information, and as explained, it is mainly classified into the following three kinds.
[0269] a. When a block is constructed according to a sound recording situation b. coding method c. playback gestalt (7.1) sound recording situation (binaural) and sound recording situations differ, there is no need, such as initial setting, that what is necessary is just to always switch according to liking of a user regardless of the capacity of equipment. Moreover, case [like binaural sound recording], a regenerative apparatus is able to carry out a switch method as shown below.
[0270] Here, the binaural sound recording for realizing binaural playback is explained in detail.
[0271] The case where the usual stereo signal is first reproduced by headphone is considered. For example, as shown in drawing (A), two microphones are arranged in the predetermined location of a concert hall, and the output of these microphones is reproduced by headphone. In this case, playback sound field will be made at a listener's regio occipitalis capitis, as a slash shows to drawing 17 (A). In order that an image may orientate this to a loudspeaker completely [while] at the usual stereophonic reproduction tone place which used the loudspeaker, the level difference of a loudspeaker on either side is for orientating completely [while] with about 10dB level difference to about 25dB being needed at a lug in headphone listening. Thus, when the usual music by which stereophonic recording was carried out is listened to by headphone, a feeling of a stereo sticks out too far strongly, and there is a problem that natural presence is not obtained.
[0272] On the other hand, in binaural playback, as a dummy head with an acoustic impedance almost equal to actual human being and an equal property is prepared, a microphone is prepared on the outskirts of external auditory meatus of both the lugs of this dummy head and it is shown in drawing 17 (B), this dummy head is put on the seat for audience of a concert hall, and the output of the microphone in a dummy head is reproduced by headphone. If such binaural playback is performed, the sound field reproduced around a listener's head will serve as range shown with the slash of drawing 17 R> 7 (A). Therefore, more natural presence can be obtained in listening by headphone or the earphone.
[0273] In order to realize such binaural playback, the above dummy heads are used, binaural sound recording records music, and suitable playback according to a listening gestalt can be performed by carrying out multiplex [of both such a work by which binaural sound recording was carried out, and the work by which stereophonic recording was carried out], and recording it on the DVD disk, as shown in drawing 18 . In addition, the record approach is not restricted to multiplex system and you may make it record the audio stereo information by which stereophonic recording was carried out, and the audio stereo information by which binaural sound recording was carried out on respectively different AOB210.
[0274] The judgment of whether to perform binaural playback formed the headset jack 400 in the regenerative apparatus at drawing 15 , as a dotted line showed, and it decided to carry out by whether the plug of headphone was inserted in this headset jack 400.
[0275] It is circuitry like drawing 19 , and gets down, and, as for this headset jack 400, the switch section 401 pushed up by contact to the plug of headphone is formed in both the upper part of a plug, and the lower part. And by pushing up these switch sections 401, the switch section 401 will be in an

open condition, and it can detect that the plug was inserted.
[0276] If the plug of headphone is inserted in a headset jack 400 by such configuration and assignment of a certain music is performed by the user, PGC300 which manages the audio stereo information by which binaural sound recording was carried out with a procedure which was mentioned above will be chosen, and the audio stereo information by which binaural sound recording was carried out will be reproduced automatically.
[0277] Therefore, a user only inserts the plug of headphone in a headset jack 400, and can listen to the music of the request by which binaural sound recording was carried out.
[0278] In addition, detection of whether the plug of headphone was inserted in the headset jack 400 can be performed to the proper timing of the playback middle class at the time of playback initiation. Moreover, when the plug of headphone is inserted in a headset jack 400, the audio stereo information by which double NORARU sound recording was always carried out may not be chosen, but the setting actuation by the input section 98 shown in drawing 15 may constitute so that a user may set up priority. For example, when having set high priority as playback of stereophonic recording, a user can hear the audio stereo information by which stereophonic recording was carried out by headphone.
[0279] (7.2) A sound cannot be heard unless the regenerative apparatus supports the coding method of the audio information currently recorded on the disk, when a block is constructed with a coding method and coding methods differ (unless it has a corresponding decoder). In such the condition, a user gets confused. Therefore, it is decided that the audio information on LPCM is recorded by all disks and that playback all whose regenerative apparatus are LPCM(s) can be performed. Therefore, no matter a user may be what audio DVD disk, only the audio information by which LPCM record was carried out is reproducible.
[0280] On the other hand, the coding method of current various kinds is put in practical use. These many are compression coding methods, and when recording especially a multichannel, it has the description that data can be used effectively. Thus, only when it has the decoder to which a regenerative apparatus corresponds when there is audio information recorded by various coding methods according to the purpose, it can choose and reproduce out of it. In this case, a regenerative apparatus is in ATS_PGCI_SRP273 explained previously according to a temporary setup by the user, initialization by the user, and a setup by the regenerative apparatus. It reproduces by choosing the optimal audio information according to the flow chart shown in drawing 19 , judging from the information which shows the coding method currently written to the item 285 of Audio coding mode.
[0281] In addition, each setting processing can be constituted so that the input section 98 shown in drawing 14 or drawing 15 may perform. Furthermore, the set-up information can be constituted so that the memory in a system controller 100 may memorize.
[0282] Moreover, when a DVD disk is set in a regenerative apparatus, or in case it is going to start playback, the control information recorded on the DVD disk as having mentioned above can be read with a system controller 100, and a sound recording gestalt, a playback gestalt, or a coding method of the audio stereo information recorded on the DVD disk etc. can also be constituted so that it may display on a display 99. By such configuration, a user can **, can know a selectable setup appropriately in a DVD disk, and can perform suitable selection actuation.
[0283] An example of the processing which chooses PGC from the information which shows a coding method hereafter according to the flow chart shown in drawing 19 is explained.
[0284] First, initiation of selection processing describes reading of ATS_PGCI_SRP273 in a line crack (step S2) and ATS_PGCI_SRP273 (step S1). The coding method currently written to the item 285 of Audio coding mode is read (step S3). Next, it judges whether there is any capacity for a regenerative apparatus to perform playback by the read coding method (step S4). consequently -- the case where there is no capacity to perform playback by the read coding method in a regenerative apparatus -- (step S4; No) -- the processing from reading of ATS_PGCI_SRP273 is repeated again (step S2-). When there is capacity for a regenerative apparatus to, perform playback by the read coding method on the other hand, it judges whether the user has chosen (step S4; Yes) and the read coding method as a temporary setup (step S5). In case playback is started for example, with remote control equipment etc., this setup is

performed during playback, and when it is going to reproduce with a coding method which is different from the existing setup about specific music, it is performed. As a result of said judgment, when the user has chosen the read coding method as a temporary setup, (step S5; Yes) and selection processing are ended, PGC300 which ATS_PGCI_SRP273 concerned shows is chosen, and playback is started (step S8).

[0285] However, when the user has not chosen the read coding method as a temporary setup, it judges whether the user has chosen (step S5; No) and the read coding method as initial setting (step S6). If this initial setting holds the fundamental coding method of a regenerative apparatus according to liking of user confidence etc. and this initial setting is performed, unless a temporary setup mentioned above will be performed, it will be reproduced by the coding method by which all music was initialized. That is, when the user has chosen the read coding method as initial setting, (step S6; Yes) and selection processing are ended, PGC300 which ATS_PGCI_SRP273 concerned shows is chosen, and playback is started (step S8).

[0286] Moreover, when the user has not chosen the read coding method as initial setting, it judges whether (step S6; No) and the read coding method have chosen as a setup of a regenerative apparatus (step S7). Unless this setup is performed in the manufacture phase of a regenerative apparatus and various setup by the user mentioned above is performed, all music will be reproduced by this set-up coding method. That is, when the read coding method has chosen as a setup of a regenerative apparatus, it ends (step S7; Yes) and selection processing, it chooses PGC which ATS_PGCI_SRP273 concerned shows, and starts playback (step S8).

[0287] in addition -- the case where the read coding method is not chosen by the error of reading data etc. as a setup of a regenerative apparatus -- (step S7; No) -- the processing from reading of ATS_PGCI_SRP273 is repeated again (step 2-).

[0288] (7.2) When a block is constructed according to a playback gestalt, selection of a playback gestalt here means choosing whether 2ch (stereo) playback is performed or multichannel playback is performed. When the regenerative apparatus supports the multichannel, the audio information on multichannel record can be chosen and it can reproduce. However, the user has the system (two or more amplifier and loudspeakers) which can reproduce a multichannel, and only when this regenerative apparatus is connected to the system, playback as an original multichannel can be performed. therefore, it is described by ATS_PGCI_SRP273 previously explained also in this case according to a temporary setup by the user, initialization by the user, and a setup by the regenerative apparatus Judging from the information which shows the number of channels currently written to the item 284 of Audio channels, according to the same flow as the flow chart which boiled previously and was shown, it reproduces by choosing the optimal audio information.

[0289] (7.3) When a block is constructed according to a coding method and a playback gestalt, as the example of drawing 12 also showed, a coding method may differ from both playback gestalt as a difference in the class of audio information within a block. In such a case, the following processings are needed.

[0290] Priority is set up to all the combination of each coding method which can process a regenerative apparatus, and each playback gestalt. An example is shown in Table 2. Such a setup is carried out as [be / possible] if needed by each setup of a temporary setup by the user, initialization by the user, and a setup by the regenerative apparatus.

[0291]

[Table 2]

＊＊ 符号化方式、再生形態の全ての組み合わせに対する優先順位

	LPCM	符号化方式A	符号化方式B
2ch再生	4	5	6
マルチチャンネル再生	1	3	2

In addition, in Table 2, it means that priority is so high that the figure in a table is small.

[0292] It reproduces by choosing the optimal audio information like the flow chart shown in drawing 21 according to this priority setup. According to the flow chart shown in drawing 21 , the optimal audio information is chosen hereafter, and an example of the reproduced processing is explained.
[0293] First, if selection processing is started (step S10), ATS_PGCI_SRP273 will be acquired (step S11) and the playback gestalt described to be the coding method described by the item 285 of Audio coding mode in ATS_PGCI_SRP273 by the item 284 of Audio channels will be read according to a block type (step S12). Next, it judges whether there is any capacity for a regenerative apparatus to perform playback by the combination of the read coding method and a playback gestalt (step S13). consequently -- the case where there is no capacity to perform playback by the combination of the read coding method and a playback gestalt in a regenerative apparatus -- (step S13; No) -- the processing from reading of ATS_PGCI_SRP273 is repeated again (step S11-). When there is capacity for a regenerative apparatus to, perform playback by the combination of the read coding method and a regenerative apparatus on the other hand, it judges whether priority is set as choosing as a temporary setup by the user to the combination of (step S13; Yes), the read coding method, and a regenerative apparatus (step S14). When the priority concerned is set up, priority is set as choosing as a temporary setup by the user as the priority number to the combination of (step S14; Yes), the read coding method, and a regenerative apparatus (step S15). And it judges whether it is the smallest within a block (step S19), this set-up priority number ends (step S19; Yes) and selection processing, in being the smallest, it chooses PGC300 which ATS_PGCI_SRP273 concerned shows, and starts playback (step S20).
[0294] However, in not being a number within a block with the set-up smallest priority number, it repeats (step S19; No) and the processing from acquisition of next ATS_PGCI_SRP273 of the block concerned (step S11-). And about the following coding method and the combination of a playback gestalt, as mentioned above, the judgment of whether the ability to regenerate is in a regenerative apparatus and the judgment of whether priority is set up as a temporary setup by the user are performed, and processing according to a judgment result is performed (step S 13, 14, 15).
[0295] On the other hand, when priority is not set up as a temporary setup by the user about the following coding method and the combination of a playback gestalt, it judges whether priority is set up as initial setting by the user about (step S14; No) and the combination concerned (step S16). When the priority concerned is set up, the priority as initial setting by the user is set up as the priority number to the combination of (step S16; Yes), the read coding method, and a regenerative apparatus (step S17). And it judges whether it is the smallest within a block (step S19), this set-up priority number ends (step S19; Yes) and selection processing, in being the smallest, it chooses PGC300 which ATS_PGCI_SRP273 concerned shows, and starts playback (step S20).
[0296] However, in not being a number within a block with the set-up smallest priority number, it repeats (step S19; No) and the processing from acquisition of next ATS_PGCI_SRP273 of the block concerned (step S11-). And about the following coding method and the combination of a playback gestalt, as mentioned above, the judgment of whether the ability to regenerate is in a regenerative apparatus, the judgment of whether priority is set up as a temporary setup by the user, and the judgment of whether the priority as initial setting by the user is set up are performed, and processing according to a judgment result is performed (step S 13, 14, 15, 16, 17).
[0297] On the other hand, when priority is not set up as initial setting by the user about the following coding method and the combination of a playback gestalt, the priority of initial setting from the beginning of a regenerative apparatus is set up as the priority number about (step S16; No) and the combination concerned (step S18). And it judges whether it is the smallest within a block (step S19), this set-up priority number ends (step S19; Yes) and selection processing, in being the smallest, it chooses PGC300 which ATS_PGCI_SRP273 concerned shows, and starts playback (step S20).
[0298] As mentioned above, when priority is set up to the combination of a coding method and a playback gestalt, selection of PGC300 based on the combination concerned and playback by the combination concerned are performed as a setting mode of the smallest number in the set-up priority.
[0299] As explained above, the combination of each coding method and each playback gestalt is received. If needed, it is possible to decide priority by a temporary setup by the user, initialization by the

user, and each setup of setting ** by the regenerative apparatus, and it is making. By Lycium chinense Without a user choosing the class one by one, even when two or more audio information that classes differ is recorded, the optimal audio information can be chosen and it can reproduce.
[0300] In addition, in the example explained using drawing 20 and drawing 21 , when assignment of neither of the setup as which the ability to regenerate by the regenerative apparatus is not suited, either, and it is chosen is performed, the display means of display 99 grade may constitute so that an alarm display may be performed.
[0301]
[Effect of the Invention] It can be made to reproduce appropriately, without being able to manage the sound information on the same contents that recording methods differ, under the contents concerned, and giving a user derangement, since the identification information which shows that said sound information is the sound information on the same contents that said recording methods differ is contained in the control information recorded on the control information record section according to the information record medium according to claim 1.
[0302] In order to classify into control information two or more sound information recorded on the sound information record section for every 1st partition unit according to the information record medium according to claim 2 The 1st partition information which identifies each 1st partition unit is included, and as said identification information, since the 1st partition information which shows that the sound information to classify belongs per the 1st same partition is established for every sound information on the same contents from which said recording method differs The sound information on the same contents that recording methods differ is manageable under the contents concerned. Therefore, since it is not necessary to specify for every sound information even if it is the sound information on the same contents that said recording methods differ, the suitable playback which does not give a user derangement can be made to perform.
[0303] As opposed to the 1st partition information which identifies the same 1st partition unit to which the sound information on the same contents that recording methods differ belongs according to the information record medium according to claim 3 Since two or more management information for every sound information concerned is prepared so that the 2nd partition information which identifies the same 2nd partition unit to which the sound information on the same contents that said recording methods differ belongs may be connected, respectively for every sound information on the same contents from which said recording method differs the sound information on the same contents that recording methods differ -- the bottom of the contents concerned -- and it is manageable for every playback unit. Therefore, since it is not necessary to specify for every sound information even if it is the sound information on the same contents that said recording methods differ, the suitable playback which does not give a user derangement can be made to perform. Moreover, since the recording method of sound information is managed by two or more management information, even if it is the sound information recorded on the DVD video format, it is possible to make it reproduce by the control information of a DVD audio format.
[0304] According to the information record medium according to claim 4, each of two or more of said management information Since the 2nd partition information which identifies a respectively equal number and the 2nd partition unit of sequence is connected to said 1st partition information, respectively for every sound information on the same contents from which said recording method differs The procedure for performing the retrieval and playback of the n-th 2nd partition unit which divide the 1st partition unit can be made the same for every sound information on the same contents from which said recording method differs, and can attain simplification of regeneration. Since this leads to communalization of processing by the regenerative apparatus and it leads to communalization of actuation by the user further, the suitable playback which does not give a user derangement is attained.
[0305] According to the information record medium according to claim 5, to said 1st partition information using the 2nd partition information connected, respectively for every sound information on the same contents from which said recording method differs Since playback time amount is recorded on the sound information record section as almost equal sound information for every sound information on

the same contents from which said recording method differs, the sound information classified for every 2nd partition unit It can prevent much more certainly not giving sense of incongruity to a user and giving a user derangement with the playback system according to each recording method, even when reproducing sound information.

[0306] According to the information record medium according to claim 6, the sound information on the same contents that said recording methods identified by said identification information differ Since multiplex is carried out and it is recorded in the same record unit in a sound information record section After identifying that it is the sound information on the same contents that said recording method changes with identification information, said record unit on which the sound information on desired was recorded based on control information can be searched, and only the sound information on the request of the sound information by which multiplex was carried out into the searched record unit can be reproduced.

[Translation done.]

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TECHNICAL FIELD

[Field of the Invention] This invention belongs to the technical field of the regenerative apparatus which reproduces sound information from an information record medium and these information record media, such as a DVD disk with which sound information, such as music from which a sound recording gestalt, a playback gestalt, or a coding method differs, was recorded.

[Translation done.]

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PRIOR ART

[Description of the Prior Art] Video DVD (disk based on DVD-Video specification) is known as a record medium which records image information, such as a movie. Video DVD is widely used as a record medium of image information, such as a movie, from the large capacity nature.
[0003] Moreover, the audio DVD (disk based on DVD-Audio specification) bearing recording only audio information, such as music instead of image information, such as a movie, in mind is developed. It becomes possible from the large capacity nature as a DVD to record the audio information equivalent to two or more CDs (compact disk) on the audio DVD of one sheet at this audio DVD. Moreover, it is also possible to record audio information which is equivalent to the music CD of the sound track version of the movie in addition to image information, such as a movie.

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EFFECT OF THE INVENTION

[Effect of the Invention] It can be made to reproduce appropriately, without being able to manage the sound information on the same contents that recording methods differ, under the contents concerned, and giving a user derangement, since the identification information which shows that said sound information is the sound information on the same contents that said recording methods differ is contained in the control information recorded on the control information record section according to the information record medium according to claim 1.
[0302] In order to classify into control information two or more sound information recorded on the sound information record section for every 1st partition unit according to the information record medium according to claim 2 The 1st partition information which identifies each 1st partition unit is included, and as said identification information, since the 1st partition information which shows that the sound information to classify belongs per the 1st same partition is established for every sound information on the same contents from which said recording method differs The sound information on the same contents that recording methods differ is manageable under the contents concerned. Therefore, since it is not necessary to specify for every sound information even if it is the sound information on the same contents that said recording methods differ, the suitable playback which does not give a user derangement can be made to perform.
[0303] As opposed to the 1st partition information which identifies the same 1st partition unit to which the sound information on the same contents that recording methods differ belongs according to the information record medium according to claim 3 Since two or more management information for every sound information concerned is prepared so that the 2nd partition information which identifies the same 2nd partition unit to which the sound information on the same contents that said recording methods differ belongs may be connected, respectively for every sound information on the same contents from which said recording method differs the sound information on the same contents that recording methods differ -- the bottom of the contents concerned -- and it is manageable for every playback unit. Therefore, since it is not necessary to specify for every sound information even if it is the sound information on the same contents that said recording methods differ, the suitable playback which does not give a user derangement can be made to perform. Moreover, since the recording method of sound information is managed by two or more management information, even if it is the sound information recorded on the DVD video format, it is possible to make it reproduce by the control information of a DVD audio format.
[0304] According to the information record medium according to claim 4, each of two or more of said management information Since the 2nd partition information which identifies a respectively equal number and the 2nd partition unit of sequence is connected to said 1st partition information, respectively for every sound information on the same contents from which said recording method differs The procedure for performing the retrieval and playback of the n-th 2nd partition unit which divide the 1st partition unit can be made the same for every sound information on the same contents from which said recording method differs, and can attain simplification of regeneration. Since this leads to communalization of processing by the regenerative apparatus and it leads to communalization of

actuation by the user further, the suitable playback which does not give a user derangement is attained.
[0305] According to the information record medium according to claim 5, to said 1st partition information using the 2nd partition information connected, respectively for every sound information on the same contents from which said recording method differs Since playback time amount is recorded on the sound information record section as almost equal sound information for every sound information on the same contents from which said recording method differs, the sound information classified for every 2nd partition unit It can prevent much more certainly not giving sense of incongruity to a user and giving a user derangement with the playback system according to each recording method, even when reproducing sound information.
[0306] According to the information record medium according to claim 6, the sound information on the same contents that said recording methods identified by said identification information differ Since multiplex is carried out and it is recorded in the same record unit in a sound information record section After identifying that it is the sound information on the same contents that said recording method changes with identification information, said record unit on which the sound information on desired was recorded based on control information can be searched, and only the sound information on the request of the sound information by which multiplex was carried out into the searched record unit can be reproduced. Although especially retrieval of said record unit over two or more sound information on the same contents that said recording methods differ in invention concerning any of claim 2 thru/or claim 5 they are is performed based on the single 1st partition unit shown using the single 1st partition information Since the single 1st partition information is established for two or more sound information of every on the same contents from which said recording method differs, the information which chooses each sound information can be given to the hierarchy of the 1st partition information level. Therefore, the sound information recorded in the DVD video format is reproducible based on the control information corresponding to a DVD audio format.
[0307] Since the information which shows said recording method is included in said control information as information which chooses the sound information on the same contents of which recording method from two or more sound information on the same contents that said recording methods differ according to the information record medium according to claim 7, selection of the sound information on the same contents of the desired recording method can be made easy. Moreover, when it is that to which the regenerative apparatus which is going to reproduce this information record medium cannot process the playback system corresponding to the recording method of said request, it can warn of the purport that assignment of the recording method concerned by the user is invalid, easily.
[0308] According to the information record medium according to claim 8, since it is any of a sound recording gestalt, a playback gestalt, or a coding method, one, or such combination, said recording method can be held, without causing a user's derangement for suitable playback of the sound information according to the capacity of the regenerative apparatus which reproduces the information record medium concerned, having corresponded to the demand of a user.
[0309] According to the regenerative apparatus according to claim 9, by the identification information contained in the control information recorded on the information record medium When the sound information based on the assignment information by the user detects that two or more sound information on the same contents that said recording methods differ is shown Since it has a playback means to reproduce the sound information on the recording method chosen with said selection means by the recording method chosen by said selection means based on said control information out of two or more sound information concerned The sound information on the same contents that the recording methods recorded on the information record medium differ can be reproduced appropriately, without giving a user derangement.
[0310] Since it has further an extract means to extract the information which shows said recording method of each sound information recorded on the information record medium concerned from said control information, and the display means of the recording method information which displays the extracted information according to the regenerative apparatus according to claim 10, a user can specify the playback system of the request corresponding to a recording method, and the suitable playback

according to a demand of a user is possible for him.
[0311] According to the regenerative apparatus according to claim 11, an input means It is not concerned with the operating state of a regenerative apparatus, but it is set up so that the input of the assignment information on said sound information may be received. Said selection means, said retrieval means, or said playback means When the contents of said assignment information inputted with said input means have modification Since it is set up based on said changed assignment information so that each processing may be performed, a demand of users, such as modification of a playback system, can be made to reflect in playback of sound information on real time, and playback suitable [one layer of reliances] is possible according to a demand of a user.
[0312] Since it has further the rewriting means which rewrites the contents of the setting information memorized by the storage means according to the regenerative apparatus according to claim 12, ** which makes the playback system which suited the use mode of a regenerative apparatus etc. memorize beforehand according to a demand of a user is made, and a suitable operating environment can be offered.
[0313] Since it has further an alarm display means to perform an alarm display when said recording method chosen by the selection means based on the assignment information or the setting information set up beforehand by the user is a recording method which cannot be processed in the regenerative apparatus concerned according to the regenerative apparatus according to claim 13, assignment or rewriting of the suitable recording method according to the capacity of a regenerative apparatus is possible for a user.
[0314] According to the regenerative apparatus according to claim 14, in an initialization condition, suitable playback is possible for said selection means by the playback system which suited the regenerative apparatus, without troubling a user's hand, since it is set up so that a recording method may be chosen based on the initialization information memorized by said storage means.
[0315] Unless said alarm display according [a selection means] to said alarm display means is performed according to the regenerative apparatus according to claim 15 Since it is set up so that the recording method based on each information may be chosen as the assignment information first inputted by said input means, the setting information rewritten by said rewriting means next, and the last by the priority of said initialization information Since the capacity of regenerative-apparatus confidence is given top priority, selection of the recording method which does not suit a regenerative apparatus can be prevented. Moreover, suitable playback in which the demand of the maximum user was made to reflect can be performed, choosing the recording method which suited the regenerative apparatus.
[0316] It has further a detection means detect the insertion condition over the headphone jack of a headphone plug according to the regenerative apparatus according to claim 16, and it can perform the suitable playback according to an operating condition, said playback means making the complicated actuation by the user unnecessary, since it is set up so that the sound information by which binaural sound recording was carried out may be retrieved, when it is detected that the headphone plug was inserted in the headphone jack by this detection means.

[Translation done.]

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] Audio DVD is going to enable playback of the multichannel which is not for the purpose of mainly recording audio information, such as music, until now. Moreover, it is going to enable not only a multichannel but high-definition playback which is not as 2ch stereophonic reproduction until now.
[0005] In such a DVD audio disk, when only the audio information on a multichannel is recorded, the people with the regenerative apparatus only for 2ch(es) produce the problem that cannot hear only some of the sounds or they can completely be reproduced.
[0006] Then, in order for people only with the regenerative apparatus only for 2ch(es) to also enable it to enjoy this disk, it is necessary to record the audio information for 2ch playback on a disk with the audio information on a multichannel.
[0007] However, two kinds of this audio information records the title same naturally and the same music in this case. Therefore, in having recorded two kinds of this audio information on the disk as it is, there is the 1st problem that the title of a same name and two kinds of music of a same name will exist, and cause a user's derangement. This 1st problem was [when sound recording gestalten, such as not only when playback gestalten such as a channel, differ, but binaural sound recording differed, or] a problem produced similarly, when coding methods, such as AC-3, differed, and the combination of these playback gestalten, a sound recording gestalt, or a coding method differed further.
[0008] Next, in the already standardized DVD video format, two or more audio information is recordable on coincidence with image information. For example, the voice of original language and the voice of a Japanese stand-in can be switched to a certain movie. Moreover, it is also possible to switch LPCM stereo voice and AC-3 multichannel voice in the same title similarly. Therefore, two or more audio information can be treated as the same title and the same music, and the class of audio information to reproduce can be changed now by changing an audio stream.
[0009] On the other hand, there is also a demand of wanting to record image information on Audio DVD, and it is going to enable record of a menu or additional information image information. In this case, a video format and transposition cannot be taken in having recorded the picture by different approach from a DVD video format. It is desirable for playback of a part with the picture of an audio disk to be also able to do the video player in a current commercial scene.
[0010] Therefore, it is necessary to make into the same structure as a DVD video format structure which records the stereo information at the time of being accompanied by the image also from these viewpoints.
[0011] However, for that, it is necessary to carry out multiplex [of two or more kinds of audio information], and to record on a disk as one object. Moreover, in order to manage two or more streams, it is necessary to place management information also into data. Therefore, when it will have the same structure as a video format, while there is little processing required for the change at the time of playback by the regenerative apparatus, the fault that the processing at the time of record becomes complicated is produced.
[0012] The function as an object for sound recording and adjustment with the studio device by which

current use is carried out are thought as important, the audio format is asked for especially the processing at the time of record not being complicated, and the structure where management information is not placed especially into data is needed for it.

[0013] Therefore, two kinds of structures, structure original with the DVD audio format in the case of recording only audio information and the structure based on the DVD video format at the time of being accompanied by the image, are needed. Thus, when it is going to reproduce only speech information to the data of two kinds of structures, since two kinds of completely different formats will exist, processing of a regenerative apparatus becomes heavy and the playback control information cannot offer unific actuation unless it makes it into the common logical structure, it has the 2nd problem of producing a user's derangement.

[0014] This invention is made in view of the above point, and it makes it the 1st technical problem to offer the regenerative apparatus which can reproduce each audio information appropriately with the information record medium which can reproduce each audio information appropriately, and the information record medium concerned, without giving derangement to a user, even if it is the case where two or more audio information that a sound recording gestalt and a playback gestalt differ from a coding method etc. is recorded on a disk.

[0015] Moreover, even when it has two kinds of structures, structure original with the DVD audio format in the case of recording only audio information, and the structure based on the DVD video format at the time of being accompanied by the image, it is making into the 2nd technical problem to offer the information record medium which can offer the environment which chooses two or more kinds of audio information by unific actuation, and the regenerative apparatus which enables the suitable playback further, without being conscious of a difference of the structure of each disk.

[Translation done.]

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MEANS

[Means for Solving the Problem] The sound information record section where two or more sound information that recording methods differed was recorded in order that an information record medium according to claim 1 might solve said technical problem, In the information record medium which has the control information record section where control information required for playback of the sound information recorded on this sound information record section was recorded, to the control information recorded on said control information record section It is characterized by containing the identification information which shows that said sound information is the sound information on the same contents that said recording methods differ.
[0017] According to the information record medium according to claim 1, the control information recorded on the control information record section will be read with a regenerative apparatus, retrieval of the sound information on the request out of the sound information recorded on the sound information record section will be performed based on this control information, and playback about the retrieved sound information will be performed. Therefore, when two or more sound information that recording methods differ about the same contents is recorded on said sound information record section, the aforementioned retrieval is needed for each sound information of every. However, in this invention, it will be recognized by the identification information contained in said control information that the sound information on said request is such sound information, and assignment according to the contents of the sound information will only be performed in the phase where a user specifies the sound information which it is going to reproduce with a regenerative apparatus, for example, the retrieval and playback of a recording method of sound information according to the throughput of a regenerative apparatus will be performed. Thus, since the sound information on the same contents that recording methods differ is manageable under the contents concerned according to this invention, derangement is not given to a user.
[0018] An information record medium according to claim 2 is set to an information record medium according to claim 1, in order to solve said technical problem. To said control information In order to classify two or more sound information recorded on said sound information record section for every 1st partition unit The 1st partition information which identifies each 1st partition unit is included further, and it is characterized by establishing the 1st partition information which shows that the sound information to classify belongs per the 1st same partition as said identification information for every sound information on the same contents from which said recording method differs.
[0019] According to the information record medium according to claim 2, the 1st partition information as control information recorded on the control information record section will be read with a regenerative apparatus, retrieval of the 1st partition unit to which the sound information on desired belongs will be performed, and playback about the sound information which belongs per the 1st searched partition will be performed. Therefore, when two or more sound information that recording methods differ about the same contents is recorded for every 1st partition unit, retrieval of the 1st partition unit is needed for each sound information of every. However, in this invention, the 1st partition information which shows that the sound information to classify belongs per the 1st same partition as

said identification information is established for every sound information on the same contents from which said recording method differs. That is, although recording methods differ, respectively, such sound information belongs per the 1st same partition, and is the same. [of the contents of the 1st partition information] Consequently, the assignment to such sound information is easy to correspond to the single 1st partition information. And since this single 1st partition information is established for every sound information on the same contents from which said recording method differs, it will be recognized in the case of reading of the 1st partition information that the sound information on desired is such sound information. And after this recognition is performed, playback about the sound information on a recording method according to the throughput of a regenerative apparatus will be performed among the sound information which belongs per the 1st single partition shown using the single 1st partition information concerned. Thus, since the sound information on the same contents that recording methods differ is manageable under the contents concerned according to this invention, even if it is the sound information on the same contents that said recording methods differ, a user does not need to specify for every sound information and does not give a user derangement.

[0020] An information record medium according to claim 3 is set to an information record medium according to claim 2, in order to solve said technical problem. To said control information In order to classify two or more sound information recorded on said sound information record section for every 2nd partition unit as one playback unit The 2nd partition information which identifies each 2nd partition unit, and the sound information classified for said every 1st partition unit using said 1st partition information so that it may constitute from sound information on 1 or two or more 2nd partition units The management information which connects said 2nd partition information and said 1st partition information is contained further. As opposed to the 1st partition information which identifies the same 1st partition unit to which the sound information on the same contents that said recording methods differ belongs It is characterized by preparing two or more management information for every sound information concerned so that the 2nd partition information which identifies the same 2nd partition unit to which the sound information on the same contents that said recording methods differ belongs may be connected, respectively for every sound information on the same contents from which said recording method differs.

[0021] According to the information record medium according to claim 3, the 1st partition information as control information recorded on the control information record section is read with a regenerative apparatus, and retrieval of the 1st partition unit to which the sound information on desired belongs is performed. Next, the management information corresponding to the 1st partition information which shows the restrained 1st partition unit is read, and the 2nd partition information connected with the 1st partition information concerned is read. About the sound information on the 1st partition unit searched previously, retrieval of the 2nd partition unit will be performed further and sound information will be reproduced for every playback unit by this 2nd partition information. Moreover, when assignment in the 2nd partition unit is directly performed by the user, retrieval of the 2nd partition unit specified by the same procedure will be performed, and only the sound information on the specified 2nd partition unit will be reproduced.

[0022] Next, when two or more sound information that recording methods differ about the same contents is recorded for every 1st partition unit, the 1st partition information which shows that the sound information to classify belongs per the 1st same partition as said identification information is established for every sound information on the same contents from which said recording method differs. Furthermore, the 2nd partition information is connected with such 1st partition information by management information for every sound information on the same contents from which said recording method differs, and this 2nd partition information gives the same 2nd partition unit to which the sound information on the same contents that said recording methods differ belongs. Although the 1st partition information is established for every sound information on the same contents from which said recording method differs as mentioned above, although the single 1st partition information will be given, the 2nd partition information is also established for every sound information on the same contents from which said recording method differs, the contents are [the contents are the same,] the same, and the single 2nd

partition information is given. Therefore, even when reproducing the sound information on a different recording method, retrieval of the 1st partition unit mentioned above and retrieval processing of the 2nd partition unit are the same about the sound information on each recording method, and can be performed by single processing under single assignment of playback of the 2nd partition unit which the 2nd partition unit followed and which was reproduced or specified. thus, the sound information on the same contents that recording methods differ according to this invention -- the bottom of the contents concerned -- and since it is manageable for every playback unit, even if it is the sound information on the same contents that said recording methods differ, a user does not need to specify for every sound information and does not give a user derangement

[0023] In order that an information record medium according to claim 4 may solve said technical problem, in an information record medium according to claim 3, each of two or more of said management information is characterized by connecting the 2nd partition information which identifies a respectively equal number and the 2nd partition unit of sequence to said 1st partition information, respectively for every sound information on the same contents from which said recording method differs.

[0024] Even if the 2nd partition information connected with the 1st partition information, respectively for every sound information on the same contents from which said recording method differs is two or more 2nd partition unit **** case according to the information record medium according to claim 4, the number and sequence of the 2nd partition unit are equally set up for every sound information on the same contents of two or more of said management information from which it is alike, respectively and said recording method differs more. Therefore, the procedure for performing the retrieval and playback of the n-th 2nd partition unit which divide the 1st partition unit can be made the same for every sound information on the same contents from which said recording method differs, and can attain simplification of processing. Since this leads to communalization of processing by the regenerative apparatus and leads to communalization of actuation by the user further, it can prevent giving a user derangement much more certainly.

[0025] An information record medium according to claim 5 is set to an information record medium according to claim 4, in order to solve said technical problem. The sound information classified for every 2nd partition unit to said 1st partition information using the 2nd partition information connected, respectively for every sound information on the same contents from which said recording method differs It is characterized by recording playback time amount on the sound information record section as almost equal sound information for every sound information on the same contents from which said recording method differs.

[0026] even if the 2nd partition information connected with the 1st partition information, respectively for every sound information on the same contents from which said recording method differs is two or more 2nd partition unit **** case according to the information record medium according to claim 5 -- the 2nd partition unit -- it is recorded that the playback time amount of the sound information boiled and classified becomes almost equal for every sound information on the same contents from which said recording method differs. Therefore, it can prevent much more certainly not giving sense of incongruity to a user and giving a user derangement with the playback system according to each recording method, even when reproducing sound information.

[0027] In order that an information record medium according to claim 6 may solve said technical problem, in an information record medium given in any 1 term of claim 1 thru/or claim 5, sound information on the same contents that said recording methods identified by said identification information differ is characterized by what multiplex is carried out to the same record location in a sound information record section, and is recorded on it.

[0028] According to the information record medium according to claim 6, the sound information on the same contents that said recording methods identified by said identification information differ will be recorded per record of a sound information record section, but irrespective of the recording method of the sound information concerned, the record unit is the same, and moreover, multiplex [of it] is carried out to the same record location concerned, and it is recorded on it. Therefore, after identifying that it is

the sound information on the same contents that said recording method changes with identification information, said record unit on which the sound information on desired was recorded based on control information can be searched, and only the sound information on the request of the sound information by which multiplex was carried out into the searched record unit can be reproduced. Although especially retrieval of said record unit over two or more sound information on the same contents that said recording methods differ in invention concerning any of claim 2 thru/or claim 5 they are is performed based on the single 1st partition unit shown using the single 1st partition information Since the single 1st partition information is established for two or more sound information of every on the same contents from which said recording method differs, the information which chooses each sound information can be given to the hierarchy of the 1st partition information level. Therefore, the sound information recorded in the DVD video format is reproducible based on the control information corresponding to a DVD audio format.

[0029] An information record medium according to claim 7 is characterized by including the information which shows said recording method at said control information in an information record medium given in any 1 term of claim 1 thru/or claim 6 as information which chooses the sound information on the same contents of which recording method from two or more sound information on the same contents that said recording methods differ, in order to solve said technical problem.

[0030] According to the information record medium according to claim 7, the sound information on the same contents of the desired recording method will be easily chosen from two or more sound information on the same contents that said recording method changes with said identification information based on the information which shows said recording method contained in said control information when it has been recognized that the sound information on desired is the sound information on the same contents that said recording methods differ. Moreover, when the regenerative apparatus which is going to reproduce this information record medium is what cannot process the recording method of said request, it can warn of the purport that assignment of the recording method concerned by the user is invalid, easily.

[0031] In order that an information record medium according to claim 8 may solve said technical problem, in an information record medium given in any 1 term of claim 1 thru/or claim 7, said recording method is characterized by being any of a sound recording gestalt, a playback gestalt, or a coding method, one, or such combination.

[0032] According to the information record medium according to claim 8, two or more sound information on the same contents that any of a sound recording gestalt, a playback gestalt, or a coding method or one differ from such combination is recorded, and suitable playback of the sound information according to the capacity of the regenerative apparatus which reproduces the information record medium concerned, having corresponded to the demand of a user will be performed, without causing a user's derangement.

[0033] The sound information record section where two or more sound information that recording methods differed was recorded in order that a regenerative apparatus according to claim 9 might solve said technical problem, It has the control information record section where control information required for playback of the sound information recorded on this sound information record section was recorded. In the regenerative apparatus with which said sound information reproduces said sound information to the control information concerned according to said control information from the information record medium containing the identification information which shows that it is the sound information on the same contents that said recording methods differ A reading means to read the recording information recorded on the information record medium, and an input means to input the assignment information which specifies the conditions which should be reproduced, A selection means to choose said recording method based on said assignment information or the setting information memorized by the storage means, It is characterized by having a playback means to reproduce the sound information on the recording method made to choose with said selection means from two or more sound information on the same contents that said recording methods differ based on said control information.

[0034] If a user specifies the conditions which should be reproduced with an input means according to

the regenerative apparatus according to claim 9, this assignment information will be inputted by the input means concerned. Next, the control information corresponding to the assignment information inputted in this way is read in an information record medium by the reading means. Moreover, based on the inputted assignment information or the setting information memorized by the storage means, the recording method which the user specified or is reproduced with a selection means according to the capacity of a regenerative apparatus is chosen. Next, the sound information on the recording method made to choose with said selection means will be reproduced by the playback means based on said control information out of two or more sound information on the same contents that said recording methods differ. Therefore, playback of the sound information on a predetermined recording method will be performed only by a user performing assignment according to the contents of the sound information on desired. Thus, according to this invention, the sound information on the same contents that the recording methods recorded on the information record medium differ can be reproduced appropriately, without giving a user derangement.

[0035] A regenerative apparatus according to claim 10 is characterized by having further an extract means to extract the information which shows said recording method of each sound information recorded on the information record medium concerned from said control information, and the display means of the recording method information which displays the extracted information in a regenerative apparatus according to claim 9, in order to solve said technical problem.

[0036] According to the regenerative apparatus according to claim 10, the information which shows said recording method of each sound information recorded on the information record medium concerned is extracted from said control information by the extract means. And the extracted information will be displayed by the display means of recording method information. Therefore, a user can specify the recording method to reproduce with reference to the displayed recording method information, and the suitable playback according to a demand of a user is possible for him.

[0037] A regenerative apparatus according to claim 11 is set to a regenerative apparatus according to claim 9 or 10, in order to solve said technical problem. Said input means It is not concerned with the operating state of a regenerative apparatus, but it is set up so that the input of said assignment information may be received. Said selection means or said playback means When the contents of said assignment information inputted with said input means have modification, it is characterized by being set up based on said changed assignment information, so that each processing may be performed.

[0038] according to a regenerative apparatus according to claim 11 -- a regenerative apparatus -- playback -- whether it is working or is under halt, the input of the assignment information on said sound information by the user is received by the input means. And when the contents of said assignment information inputted by doing in this way have modification, each processing is performed by said selection means or said playback means based on said changed assignment information. Therefore, since a demand of users, such as modification of a recording method, can be made to reflect in playback of sound information on real time, according to a demand of a user, playback suitable [one layer of reliances] is possible.

[0039] A regenerative apparatus according to claim 12 is characterized by having further the rewriting means which rewrites the contents of the setting information memorized by said storage means in a regenerative apparatus given in any 1 term of claim 9 thru/or claim 11, in order to solve said technical problem.

[0040] According to the regenerative apparatus according to claim 12, if a user directs rewriting of said setting information with a rewriting means, the contents of the setting information memorized by said storage means will be rewritten by the rewriting means. Therefore, since ** which makes the recording method which suited the use mode of a regenerative apparatus etc. memorize beforehand according to a demand of a user is made, a suitable operating environment can be offered.

[0041] A regenerative apparatus according to claim 13 is characterized by equipping it with an alarm display means to perform an alarm display, further, when said recording method chosen as any 1 term of claim 9 thru/or claim 12 by said selection means in the regenerative apparatus of a publication based on said assignment information or said setting information cannot process in the regenerative apparatus

concerned, in order to solve said technical problem.
[0042] According to the regenerative apparatus according to claim 13, an alarm display is performed by the alarm display means when said recording method chosen by the selection means based on said assignment information or said setting information cannot process in the regenerative apparatus concerned. Therefore, assignment or rewriting of the suitable recording method according to the capacity of a regenerative apparatus is possible for a user.
[0043] In order that a regenerative apparatus according to claim 14 may solve said technical problem, in a regenerative apparatus given in any 1 term of claim 9 thru/or claim 13, said selection means is characterized by being set up so that a recording method may be chosen based on the initialization information memorized by said storage means in an initialization condition.
[0044] According to the regenerative apparatus according to claim 14, in an initialization condition, selection of the recording method by said selection means is performed based on the initialization information beforehand memorized by said storage means. Therefore, suitable playback is possible by the recording method which suited the regenerative apparatus, without troubling a user's hand.
[0045] In a regenerative apparatus given in any 1 term of claim 9 thru/or claim 11 in order that a regenerative apparatus according to claim 15 may solve said technical problem The rewriting means which rewrites the contents of the setting information memorized by said storage means, When said recording method chosen by said selection means cannot process with the regenerative apparatus concerned based on said assignment information or said setting information In an alarm display means to perform an alarm display, and an initialization condition It has the selection means set up so that a recording method may be chosen as said storage means based on the initialization information memorized beforehand. This selection means Furthermore, the assignment information first inputted by said input means unless said alarm display by said alarm display means was performed, Next, it is characterized by being set up so that the recording method based on each information may be chosen as the setting information and the last which were rewritten by said rewriting means by the priority of said initialization information.
[0046] According to the regenerative apparatus according to claim 15, although it will be based on any of the information which the user specified as real time, the setting information which the user rewrote beforehand, or initialization information a recording method is and will be chosen by the selection means, priority is prepared in this selection processing. This priority serves as assignment of the capacity of regenerative-apparatus confidence and the user of real time, rewriting of the setting information by the user, and sequence of initial setting. Therefore, since the capacity of regenerative-apparatus confidence is given top priority, the recording method which does not suit a regenerative apparatus is not chosen. Moreover, when the assignment or rewriting by the user is not performed, a suitable recording method is chosen by initialization information. However, suitable playback in which the demand of the maximum user was made to reflect can be performed, choosing the recording method which suited the regenerative apparatus, since it can specify on real time even when this information can be suitably rewritten according to a demand of a user and still such rewriting is performed.
[0047] In a regenerative apparatus given in any 1 term of claim 9 thru/or claim 15 in order that a regenerative apparatus according to claim 16 may solve said technical problem It has further a detection means to detect the insertion condition over the headphone jack of a headphone plug. Said playback means When it is detected that the headphone plug was inserted in the headphone jack by this detection means, it is characterized by being set up so that the sound information by which binaural sound recording was carried out may be reproduced.
[0048] According to the regenerative apparatus according to claim 16, if a user inserts a headphone plug in a headphone jack, this insertion will be detected by the detection means and will retrieve the sound information by which binaural sound recording was carried out. Therefore, especially when the sound information by which binaural sound recording was carried out is recorded on the information record medium which it is going to reproduce, even if it does not perform actuation of specifying this sound information by which binaural sound recording was carried out, the sound information which suited headphone playback and by which binaural sound recording was carried out will be reproduced.

Therefore, it is possible to perform suitable playback according to an operating condition, making complicated actuation by the user unnecessary.
[0049]
[Embodiment of the Invention] Hereafter, the suitable operation gestalt of this invention is explained with reference to a drawing.
[0050] (1) They are image information and speech information (music information is also included.) at the beginning of a DVD video format. Hereafter, the record format on the video [being the same] DVD (physical record format) is explained using drawing 1 .
[0051] (1.1) As shown in physical format drawing 1 , video DVD 1 has the lead-out area LO in the outermost periphery while having the lead-in groove area LI in the most-inner-circumference section, and the meantime is a video video zone, and it is divided and recorded on two or more VTS(Video Title Set) 4 (VTS#1 thru/or VTS#n) to which image information and speech information have ID (discernment) number in each. It is the set (settlement) which put together the title (attributes, such as the number of the speech information contained in it and subimage information, and a specification, correspondence language, are the same) (one work which manufacturers, such as a movie, are going to show to a viewer) relevant to VTS here. UDF (Universal Disk Format)2 which has the information which manages the format to the file immediately recorded by the periphery in the disk concerned of the lead-in groove area LI is recorded, and VMG (Video Manager)3 is recorded following it. This information recorded as VMG3 is the whole image information and the speech information which are recorded on the videos DVD 1 concerned, such as a menu in which the selections to a user are shown, and an access table for accessing the information for illegal copy prevention, or each title, management information.
[0052] VTS4 of 1 is divided and recorded on two or more VOB(Video OBject) 10 which has an ID number in each by making VTSI (Video Title Set Information)11 into a head. Here, the part constituted by two or more VOB10 is called VOB set (VOBS).
[0053] Information, such as PGCI (Program Chain Information) which are the various information about the program chain which is the logical partition which combined two or more cels (it mentions later about a cel.), is recorded on VTSI11 recorded on the head of VTS4. Moreover, the stereo parts of image information and speech information are recorded on each VOB10.
[0054] VOB10 of 1 is constituted by two or more cels 20 which have an ID number in each. The cel 20 of 1 is constituted by two or more VOB units (VOBU) 30 which have an ID number in each. Here, VOBU30 is one unit constituted by only either or the below-mentioned Navi-pack of image information, speech information, and subimage information (the information on subimages, such as a title in a movie, is said.).
[0055] VOBU30 of 1 is constituted by Navi-pack 41 in which the control information which makes a controlled system image information included in VOBU30 is stored, the video pack 42 containing the video data as image information, the audio pack 43 containing the audio data as speech information, and the subpicture pack 44 containing the subpicture data as subimage information. Here, only image data are recorded as a video data and only voice data is recorded as audio data. Moreover, as subpicture data, only graphical data, such as an alphabetic character as a subimage and a graphic form, are recorded.
[0056] The read-out initiation time information called SCR (System Clock Reference) which shows the read-out start time on the playback time-axis which should read the data contained in each pack P from the track buffer in the below-mentioned regenerative apparatus, and should start the input to each buffer, the start code which shows that it is initiation of Pack P are recorded on the pack header recorded on the head of each pack P.
[0057] Navi-pack 41 is constituted by the PCI (Presentation Control Information) data 50 which are the information about the playback display control at the time of indicating [voice / which was searched based on the DSI (Data Search Information) data 51 which are the retrieval information (address on DVD1 with which image concerned or voice etc. it indicates / voice / by playback is specifically recorded etc.) for searching an image or voice etc. it indicates / voice / by playback, and the DSI data 51 / the image or the voice] by playback.

[0058] All the video packs 42 included in VOBU30 of 1 are constituted by 1 or two or more GOP(s) (Group Of Picture). Above GOP is the minimum image unit refreshable [independent / which is defined in the specification of the MPEG 2 (Moving Picture Experts Group 2) method which is a picture compression method adopted in case image information is recorded on DVD1 in the gestalt of this operation].
[0059] Each partition carries out a partition setup and the manufacturer (only henceforth a manufacturer) of recording information who makes it record in DVD1 makes it record free according to the intention in a record format of the layered structure shown in drawing 1 explained above. By reproducing based on the below-mentioned logical structure for every partitions of these, it becomes reproducible [the versatility which was rich in change].
[0060] (1.2) Explain a logical format, next the logical format (logical structure) which combined the information recorded by the physical partition shown in drawing 1 using drawing 2 . In addition, the playback control information (access information or hour entry) for reproducing the logical structure shown in drawing 2 combining each data (especially cel 20) shown in drawing 1 by the logical structure which information is not actually recorded on DVD1 with the structure, and is shown in drawing 2 is the things on DVD1 currently recorded especially in VTSI11.
[0061] For convenience, when it explains from the hierarchy of the low order of drawing 2 , the program 60 of 1 is constituted on logic by choosing and combining two or more cels 20 among the physical structures of explanation explained in above-mentioned drawing 1 . In addition, a manufacturer can also give a definition as a smallest unit which a viewer can choose freely 1 or the summarized thing, and can view and listen to this program 60, and this unit is called PTT (Part of Title).
[0062] Here, about the number of the cel 20 of 1, in case it is dealt with as a cel ID number in case the cel 20 concerned is dealt with in the physical format shown in drawing 1 (it is indicated as cel ID# among drawing 1 .), and it is dealt with in the logical format shown in drawing 2 , it is dealt with as a cel number in order of the description in the below-mentioned PGCI.
[0063] Two or more programs 60 are combined and PGC (Program Chain)61 of 1 is constituted on logic. PGCI mentioned above is defined by this unit of PGC61, and the number of the address which is a record location on the playback sequence (the program number of a proper is assigned every program 60 by this playback sequence.) of the cel 20 for every program 60 at the time of reproducing each program 60 and DVD1 of each cel 20, and the head cel 20 in the program 60 of 1 which should be reproduced etc. is contained in the PGCI concerned.
[0064] Besides Above PGCI, data, such as an ontic image and voice, will be contained in PGC61 of 1 noting that a program 60 should put together (if it puts in another way, noting that a cel 20 should put together).
[0065] The title 62 of 1 is constituted on logic by 1 or two or more PGC61. This title 62 will be a unit equivalent to one movie, if it says for example, for image information, and it is completed information which a manufacturer offers to the viewer of DVD1.
[0066] VTS63 of 1 is constituted on logic by 1 or two or more titles 62.
[0067] The information equivalent to VTS63 of 1 shown in drawing 2 is equivalent to the information included in VTS4 of 1 shown in drawing 1 . That is, in VTS63 shown in DVD1 at drawing 2 , all the information included on logic will collect as VTS4 of 1, and will be recorded.
[0068] When a manufacturer specifies the information classified in the physical structure based on the logical format explained above, an outstanding image or music is formed for a viewer.
[0069] (2) A DVD audio format, next audio information (music and speech information are also included.) Hereafter, the record format on the audio [being the same] DVD (physical record format) is explained using drawing 3 .
[0070] (2.1) Explain the physical format on Audio DVD (physical record format) at the beginning of a physical format using drawing 3 .
[0071] First, as shown in drawing 3 , the audio DVD 200 of an operation gestalt has the lead-out area LO in the outermost periphery while having the lead-in groove area LI in the most-inner-circumference section, and serves as a volume space of 1 in the meantime. Into this, an audio zone is surely recorded.

Speech information is divided and recorded on each by two or more ATS (Audio Title Set)203 (ATS#1 - ATS#n) which has ID (discernment) number in this audio zone. SAPPT (Simple Audio Play Pointer Table)204 as playback control information for simple playbacks (two-channel playback etc.) is recorded on the head of an audio zone. This SAPPT is recorded on all the DVD disks that have an audio zone. In addition, SAPPT204 may be recorded into the lead-in groove area LI or below-mentioned AMG202.
[0072] UDF (Universal Disk Format)201 which has the information which manages the format to the file immediately recorded by the periphery section in the disk concerned of the lead-in groove area LI is recorded, SAPPT204 is recorded following UDF201, and AMG (Audio Manager)202 is recorded continuously. However, arrangement of the file of UDF201, SAPPT204, and others is not having to be this order.
[0073] The information recorded on this SAPPT204 is information required to reproduce LPCM data by 2ch(es). Moreover, the information recorded as AMG202 is the whole speech information currently recorded on the audios DVD 200 concerned, such as a menu for demanding item selection from a user, and an access table for accessing the information for illegal copy prevention, or each title, management information.
[0074] ATS203 of 1 consists of two or more AOB(Audio Object) 210 which has an ID number in each by making ATSI (Audio Title Set Information)211 into a head.
[0075] Here, the part constituted by two or more AOB210 is called AOB set (AOBS). This AOB set is the stereo part of speech information.
[0076] Information, such as APGCI (Audio Program Chain Information) as playback control information which is the various information about the program chain which is the logical partition which combined two or more cels (it mentions later about a cel.), is recorded on ATSI211 recorded on the head of ATS203. Moreover, the stereo part of speech information is recorded on each AOB210. AOB210 of 1 is constituted by two or more cels 220 which have an ID number in each.
[0077] The cel 220 of 1 is constituted by two or more audio packs 230 pack-ized, respectively, or an audio pack and the real-time information pack (Real Time Information Pack) 231. The audio information which the audio pack 230 pack-ized speech information which should be recorded on Audio DVD for every predetermined magnitude, for example, was digitized by Linear PCM etc. is included. Text information, BPM (Beat Per Minutes), ******, etc. are contained in the real-time information pack 231.
[0078] In a record format of the layered structure shown in drawing 3 explained above, according to the intention, free, the manufacturer (only henceforth a manufacturer) of recording information who makes it record in an audio DVD 200 does a partition setup, and, as for each partition, can record. By reproducing based on the below-mentioned logical structure for every partitions of these, it becomes reproducible [the versatility which was rich in change].
[0079] (2.2) Explain a logical format, next the logical format (logical structure) which combined the information recorded by the physical partition shown in drawing 3 using drawing 4 .
[0080] In addition, as for the logical structure shown in drawing 4 , information is not actually recorded on the audio DVD 200 with the structure. On Audio DVD, speech information is recorded in the physical format shown in drawing 3 to the last, and the information for reproducing this speech information is the logical format shown in drawing 4 , and is recorded on SAPPT204, AMG202, and ATSI211 which were mentioned above.
[0081] If it explains from the hierarchy of the low order of the expedient above figure 4 of explanation, an index 259 is constituted by choosing the cel or two or more cels 220 of one, and combining them among the physical structures explained in above-mentioned drawing 3 . An index can be used also as a tune number and is the minimum accessible unit by the user.
[0082] The truck 260 of 1 is constituted by 1 or two or more indexes 259 on logic. This truck 260 is an information unit equivalent to one music. A user can choose the truck (music) of arbitration and can access direct.
[0083] Here, about the number of the cel 220 of 1, in case it is dealt with as a cel ID number in case the cel 220 concerned is dealt with in the physical format shown in drawing 3 (it is indicated as cel ID#

among drawing 3 .), and it is dealt with in the logical format shown in drawing 4 , it is dealt with as a cel number in order of the description in the below-mentioned APGCI.
[0084] A truck 260 (music) is an information unit containing two or more cels, and is a set of a cel which has a certain common attribute etc. That is, all of the attribute of all the cels in a truck are the same. Moreover, all the cels contained on a truck are adjacently recorded in the same object.
[0085] 1 or two or more trucks 260 are combined, and the title 261 of 1 is constituted on logic. However, this title itself is not recognized as a unit of access from a user. Therefore, a title number cannot be specified and the title of arbitration cannot be accessed.
[0086] Audio DVD can define independently the attribute of each truck 260 which constitutes a title 261 in a maximum of 8 pattern. That is, attributes as speech information, such as the number of channels, the quantization approach, and a sampling frequency, may be changed into each truck (music) of every.
[0087] APGCI mentioned above is defined by the unit of this title 261, and the number of the address which is a record location on the playback sequence of the cel 220 for every truck 260 at the time of reproducing the attribute of each truck and each truck 260 and the audio DVD 200 of each cel 220, and the head cel 220 in the truck 260 of 1 which should be reproduced, the playback system of each truck 260, and various commands are contained in the APGCI concerned.
[0088] Besides Above APGCI, ontic speech information will be contained in the title 261 of 1 noting that a truck (music) 260 should put together (if it puts in another way, noting that a cel 220 should put together).
[0089] The title group 262 of 1 is constituted on logic by 1 or two or more titles 261. Moreover, the title group 262 is the greatest unit which a user can access, and can give a definition to a maximum of nine pieces among 1 volume. This title group 262 is constituted by 1 or two or more titles 261 which gathered based on a certain fixed relevance, and all the titles in a title group are reproduced continuously. For example, music's collection of a certain singer and a composer etc. can be gathered as one title group.
[0090] The volume 263 of 1 is constituted on logic by 1 or two or more title groups 262. This volume 263 is an information unit equivalent to the album (DVD) of one sheet.
[0091] The actual speech information contained in the title of 1 shown in drawing 4 will be recorded on Audio DVD in any 1 ATS203 shown in drawing 3 .
[0092] When a manufacturer specifies the information classified in the physical structure based on the logical format explained above, the music which a viewer listens to is formed.
[0093] (3) Explain the class of disk in the class of DVD, next DVD. In addition, in the following explanation, the information which contains both an image and voice like a movie may be called "AV information" about the information recorded on DVD, and the information only on the image part is called "video (or image) information." Moreover, the information only on speech information [like music] only whose voice part of AV information, such as a movie, is is called "audio (or voice) information."
[0094] moreover, as a DVD player which plays these DVD disks of various kinds of The video DVD player which can reproduce AV information by DVD video format (it is hereafter called a "video player".) The audio DVD player which reproduces the audio information by DVD audio format with various playback gestalten (it is hereafter called an "audio player".) The simple audio DVD player which reproduces the LPCM audio information by DVD audio format by 2ch(es) (it is hereafter called a "simple audio player".) And both AV information on a DVD video format and the audio information on a DVD audio format have four kinds of refreshable compatible DVD players (it is hereafter called a "compatible player".). Each DVD player is explained to a detail later.
[0095] As a DVD which records AV information or audio information, Video DVD, the video DVD with audio navigation, audio-only DVD, and four kinds of disks both for [DVD] an audio video exist. The physical format of four kinds of DVDs is roughly shown in drawing 5 .
[0096] In addition, all of a disk configuration or information recording methods (the modulation approach, a track pitch, pit size, etc.) of these DVDs are the same, and the informational contents (contents) only differ.

[0097] (3.1) Video DVD shows video DVD drawing 5 to the maximum upper case. The audio information (namely, AV information) reproduced by video information, such as a movie according to a DVD video format, and it and coincidence is recorded on this disk. Therefore, only a video zone exists in the record section between the lead-in groove area LI and the lead-out area LO, but playback control information, video information, and audio information are included and recorded on two or more VTS (s), and VMG containing the management information of them VTS is recorded on it. As explained with reference to drawing 1 , video information is recorded as a video pack and audio information is recorded as an audio pack.
[0098] This video DVD is navigation information (information which specifies the control information for playback.) included in the management information currently recorded on VMG. It explains in full detail behind. It is based and a video player and a compatible pull player are reproduced. However, since the navigation information by DVD audio format is not recorded, in an audio player, it is unreproducible.
[0099] (3.2) A kind of the videodisk called the video DVD with audio navigation shows the 2nd step of video DVD with audio navigation. It is the disk which is an audio player and made it possible to reproduce only the audio information on AV information on VOB in VTS by having recorded the navigation information by DVD audio format in addition to playback of video information (the accompanying audio information is included), such as a movie by DVD video format, being possible for this video DVD with audio navigation at a video player. Moreover, the part of AV information which can reproduce only audio information by the audio player is called audio play PERT.
[0100] The record gestalt of the video DVD with audio navigation is recorded with the gestalt of VTS of plurality [information / AV] in the video zone based on the DVD video format shown in drawing 1 . In addition, ATSI including playback control information required in order that the video DVD with audio navigation may reproduce only the audio information in VTS based on the DVD audio format ahead of the video zone as an audio zone is recorded as ATS, and AMG as management information of ATS is recorded. In ATS, AOB which is the stereo part of audio information is not recorded. That is, the navigation information for reproducing the audio information (specifically every audio PUREIPATO audio pack in VOB (referring to drawing 1)) included in each VTS in the video DVD with audio navigation by the audio player is described by this AMG and ATSI.
[0101] Moreover, SAPPT is recorded on the head of an audio zone. The navigation information for reproducing the LPCM audio information included in VTS by 2ch(es) is described by this SAPPT.
[0102] This video DVD with audio navigation is played by the video player and the compatible player based on the navigation information currently recorded on VMG. Moreover, based on the navigation information currently recorded in AMG, audio play PERT's audio information is reproduced with various playback gestalten according to the capacity of a player by the audio player. Moreover, based on the navigation information currently recorded on SAPPT, audio play PERT's LPCM information is reproduced by 2ch(es) by the simple audio player.
[0103] (3.3) It is audio-only DVD which is shown in the 3rd step of audio-only DVD. Except for the static image and text information on some, only audio information is recorded on this disk. Therefore, only an audio zone exists in the record section between the lead-in groove area LI and the lead-out area LO, but ATSI and AOB are recorded on it as two or more ATS, and AMG containing the management information of these ATS is recorded on it. Furthermore, SAPPT is recorded on the lead-in groove area LI or an audio zone.
[0104] Moreover, each ATS contains 1 or two or more AOB(s) which are the stereo parts of audio information. Based on the navigation information by which this audio-only DVD is recorded on AMG, the audio information in an audio zone is reproduced with various playback gestalten according to the capacity of a player by the audio player and the compatible player. Moreover, based on the navigation information currently recorded on SAPPT, the LPCM information in an audio zone is reproduced by 2ch (es) by the simple audio player. However, since the navigation information by DVD video format is not recorded, in a video player, it is unreproducible.
[0105] (3.4) It is called the audio video two ways DVD to be shown in the bottom of DVD drawing 5

both for an audio video. An audio zone and a video zone are between the lead-in groove area LI and Lead-out LO. Based on the DVD video format, VTS including VMG, playback control information, and AV information (VOB) as a stereo is recorded on the video zone like Video DVD. SAPPT is recorded on the lead-in groove area LI or an audio zone.
[0106] Based on a DVD audio format, two or more ATS (1 drawing ATS# # 2) including SAPPT, AMG, playback control information, and the audio information as a stereo is recorded on an audio zone like audio-only DVD. Furthermore, ATS (drawing ATS# 3) only including the playback control information for reproducing only the audio information on VOB in VTS of a video zone is also recorded. That is, in the audio video two ways DVD, AV information by DVD video format and the audio information by DVD audio format are recorded on a separate field.
[0107] AMG not only contains the management information of all ATS in an audio zone, but in the case of both for [DVD] an audio video, be involved all ATS and VTS(s) in an audio zone and a video zone -- ********** is included. moreover, SAPPT should also be involved all ATS and VTS(s) in an audio zone and a video zone -- ********** is included. However, the management information is related with LPCM data reproducible by 2ch(es) of both zones.
[0108] here, the point that the point that the audio video two ways DVD differ from a videodisk with audio navigation and audio-only DVD is classified into an audio zone and a video zone, the record section of a disk boils it, respectively, and AV information by DVD video format and the audio information by DVD audio format are recorded, AMG recorded on an audio zone, and SAPPT should be involved all ATS and VTS(s) in a disk -- it is the point that ********** is included.
[0109] If it explains in more detail, based on the DVD video format, in VOB, multiplex [of the audio information] is carried out to video information per pack, and it is recorded on the videodisk with audio navigation. And ATS is constituted as ATSI and APGCI which is the playback control information for reproducing the audio information recorded in VOB manages only such ATS by AMG. The management information of the title in a video zone is not recorded on AMG. The navigation information about the audio play PERT of a video zone is similarly described by SAPPT.
[0110] On the other hand, with the audio video two ways DVD, the field where the audio information by DVD audio format and AV information by DVD video format are recorded exists separately. The stereo part of audio information is recorded on each ATS as two or more AOB(s) by the DVD audio format shown in the audio zone at drawing 3 . Furthermore, two kinds of ATS of ATS (audio stereo information is in a video field, and only ATSI which is navigation information exists as ATS.) recorded in ATSI by setting to APGCI playback control information of the audio information recorded on VOB in VTS of not only ATS that recorded in ATSI APGCI which is the playback control information of the audio information in each ATS but a video zone is recorded. That is, it is not concerned with a zone but ATS is managed by AMG for all the playback control information in connection with playback of audio information. Furthermore, the information about a truck reproducible by 2ch among the playback control information in connection with playback of the LPCM audio information currently recorded on all ATS and VTS(s) is recorded on SAPPT.
[0111] On the other hand, AV information was recorded as two or more VTS(s), and the inside of a video zone was further recorded in VTSI by having set playback control information of AV information in each VTS to PGCI, and has managed all these VTS(s) by VMG. On the other hand, AMG has also managed all the playback control information about AV information playback of a video zone.
[0112] In the case of audio-only DVD and both for [DVD] an audio video, AMG serves as comprehensive management information, and, specifically, in the case of Video DVD, VMG becomes with main management information. In the case of the video DVD with audio navigation, AMG has managed only about playback of only the audio information in VOB by the audio player, and management of a video title is not performed.
[0113] Moreover, in the case of audio-only DVD and both for [DVD] an audio video, SAPPT becomes with the comprehensive management information for reproducing LPCM audio information by 2ch(es) by the short form, a portable mold audio player, etc. In order that there may be no SAPPT, even if it is recorded by LPCM in the case of Video DVD, only audio information by the simple player is not

reproduced. In the case of the video DVD with audio navigation, SAPPT has managed only about playback of the LPCM audio information (audio-only title) of the audio play PERT in VOB by the simple audio player, and management of a video title is not performed.
[0114] taking such structure -- the capacity of a regenerative apparatus -- responding -- the optimal playback -- it can do -- in addition -- and compatibility which is adjustable between each disk and each regenerative apparatus is realized.
[0115] (4) Explain in more detail about playback control of a title, next playback control of a title. Here, a title points out some of a series of works with the common playback gestalt which consists of stereo information recorded on DVD, such as AV information and audio information, and playback control information which shows the playback procedure (presentation), or works. As the physics and the logical format of Audio DVD described, a user does not direct to choose a direct title and to start playback to a player. A user chooses one or the title group who consists of two or more titles, and starts playback. However, the title group is reproduced by reproducing each title for what kind of titles the title group in whom the player was directed consists of continuously, judging from the navigation information in AMG and ATSI. Therefore, in a DVD player, playback of a title is to a base. Then, the disk both for an audio video is explained to an example about playback control of the title in a DVD audio format, and a title.
[0116] (4.1) the kinds of a title -- the title (title 261 of drawing 4) in a DVD audio format is first classified into the audio title (henceforth referred to also as "AOTT (Audio Only TiTle)") constituted by playback of the speech information in an audio range, and the video title constituted by playback of AV information in a video field. Moreover, a video title is classified into two kinds, the title only for images (henceforth referred to also as "AVTT (Audio Video TiTle)"), and the title both for image voice (it is also henceforth called "AVTT/AOTT (Audio Video TiTle/Audio Only TiTle)"). In addition, in a DVD video format, it is only a title only for images.
[0117] AOTT is a title by which only audio information is reproduced and the stereo information is constituted by the audio information recorded on AOB in an audio zone.
[0118] AVTT is a title by which audio information is surely reproduced with video information, and the stereo information is constituted by AV information recorded on VOB in a video zone. In AVTT, playback of only audio information is not accepted but reproducing with video information becomes indispensable.
[0119] Also when only audio information is the title (that is, it can be called the title in two ways) which can also be reproduced and can also reproduce audio information with video information as AV information and AVTT/AOTT is any, the stereo information is constituted by AV information recorded on VOB in a video zone.
[0120] It is dependent on the capacity of a regenerative apparatus as which of AV information and audio information this AVTT/AOTT is reproduced. That is, with the regenerative apparatus (audio player) which does not have the ability to regenerate of AV information, AVTT/AOTT is reproduced only for audio information and AVTT/AOTT is reproduced with audio information with video information with the regenerative apparatus (a video player and compatible player) which has the ability to regenerate of AV information.
[0121] By the way, two navigation information, the navigation information for audio players and the navigation information for compatible players, is separately recorded on AMG. The navigation information for audio players is the audio-only TAITORUSACHI pointer which described the navigation information for reproducing only the speech information of the title in two ways constituted by AV information in VOB of the audio title (AOTT) constituted by the audio information in AOB of an audio zone, and a video zone, and this is recorded on an audio-only TAITORUSACHI pointer table (AOTT_SR). On the other hand, the refreshable audio title search pointer which is the navigation information for compatible players is recorded on an audio title search pointer table (ATT_SR) in the title of all classes. Such navigation information is further explained in full detail by explanation of drawing 8 .
[0122] In reproducing these audio video two ways DVD by the video player, according to the navigation

information for video players currently recorded on VMG and VTSI in a video zone, it reproduces AV information in each VTS.
[0123] Moreover, in reproducing these audio video two ways DVD by the audio player, with reference to AOTT_SR in AMG in an audio zone, it reproduces audio information according to the playback control information for audio players currently recorded on ATSI. In reproducing audio information by the audio player, there are two cases. One is the case where the audio information in AOB is reproduced according to ATSI and APGCI which are AMG of an audio zone, and the navigation information in ATS, and another is the case where the audio information recorded on VTS in a video zone according to AMG and ATSI, and APGCI is reproduced like a videodisk with audio navigation. In the case of the latter, to the same object, in a video player, it reproduces as AV information accompanied by an image, and only audio information is reproduced by the audio player.
[0124] Furthermore, when reproducing these audio video two ways DVD by the compatible player, with reference to ATT_SR which is the navigation information for the compatible players in AMG in an audio zone, the audio information in an audio zone and AV information in a video zone are reproduced integrative according to the playback control information currently recorded on ATSI and VTSI.
[0125] All the titles in the audio video two ways DVD are managed by AMG, and are classified into either of the above-mentioned three kinds of a DVD audio format of titles. The case where the audio video two ways DVD which have the example of a logical format shown in drawing 6 using the compatible player which has the ability to regenerate of both a DVD audio format and a DVD video format are reproduced now is considered. In these audio video two ways DVD, volume shall consist of seven title groups of #1-#7, and each title group shall be constituted by one title. 1 or two or more trucks are included in one title. In drawing 6 , the navigation information (ATT_SR) for compatible pull players in a left column, the navigation information (TT_SR) for video players in a central train, and a right train show the image of the navigation information (AOTT_SR) for audio players.
[0126] Since title #2 and #5 are AOTT(s), at the time of playback of these titles, only the audio information recorded on AOB in the audio zone both for [DVD] an audio video is reproduced.
[0127] Since title #4, #6, and #7 are AVTT(s), AV information recorded in VOB in the video zone both for [DVD] an audio video is reproduced. Therefore, an image and voice will surely be reproduced.
[0128] Moreover, since title #1 and #3 are AVTT/AOTT, a compatible player reproduces both voice and an image based on the video and audio information which were recorded on VOB in the video zone of DVD both for an audio video. In addition, when the audio player which does not have the ability to regenerate of video information is used, in title #1 and #3, only the audio information recorded on VOB in the video zone both for [DVD] an audio video is reproduced (refer to the right column of drawing 6). That is, the AVTT/AOTT title is created so that recording information may be reproduced by the approach that the capacity can be demonstrated to the maximum extent, according to the capacity of the regenerative apparatus which is going to play the DVD disk concerned.
[0129] In addition, in order to lose the derangement at the time of title group playback, it is promised that AVTT cannot constitute other titles (AOTT, AVTT/AOTT) and title groups of a class.
[0130] (4.2) Explain the <TXF FR=0002 HE=250 WI=080 LX=1100 LY=0300> concept of PGCI specified about VOB in duplex management of VOB, next the video zone both for [DVD] an audio video, and APGCI. In VOB, it is recorded in the form where multiplex [of video information and the audio information] was carried out. When reproducing VOB as AV information, it will reproduce according to PGCI and this is the same concept as the case of Video DVD. Thus, since record of AV information in Audio DVD and the reproductive method were doubled with the video format, compatibility with a video player will be maintained. On the other hand, although it reproduces according to APGCI in reproducing only the audio information in VOB, this APGCI is specified independently of PGCI. This is explained with reference to drawing 7 .
[0131] Drawing 7 shows the concept of the program in the case where one certain VOB is reproduced as AV information according to PGCI, and the case of reproducing only as audio information according to APGCI. In drawing 7 , a video data, SAPUPIKU tea data, and audio data are contained in VOB. When reproducing this VOB as AV information, that playback control is performed based on PGCI. The VOB

concerned is divided into six video cel #1-#6, by video cel #1, video cel #2-#4 constitute video program #2, and video cel #6 constitute video program #3 for video program #1 from PGCI. When reproducing AV information with the video player and compatible player like AVTT/AOTT, playback is performed according to such PGCI.

[0132] On the other hand, when an audio player reproduces only audio information from the same VOB, playback is performed according to APGCI. The audio program specified by APGCI is constituted by 1 or two or more audio cels, respectively. here, it comes out to the same object (VOB), and even if it is, it can be specified that an audio cel differs from a video cel (independently) (natural -- it is also possible to specify it be in agreement). That is, the starting position of each audio cel, a termination location, etc. can set up which video cel independently. Moreover, the playback sequence of the audio cel specified by APGCI can be specified independently of the playback sequence of the video cel specified by PGCI.

[0133] Audio program #1 is constituted by audio cel #1 and #2, and audio program #2 are constituted from an example of drawing 7 by audio cel #3. APGCI includes information, such as a record location of the audio cel contained in these audio program, and playback sequence, and playback of audio information is performed based on this.

[0134] Thus, the reason which enabled it to specify an audio cel independently of a video cel is for managing audio information independently of AV information. By carrying out like this, when reproducing only the audio information in VOB, it becomes possible to perform time management etc. independently of AV information. Moreover, even if it reproduces only for audio information among the audio information included in AV information, it becomes reproducible [a meaningful part]. You may be giving a definition as the same cel, of course.

[0135] (4.3) Explain the playback of each above-mentioned title in a title search pointer, next the audio video two ways DVD which used the title search pointer with reference to drawing 6 and drawing 8 .

[0136] The example of the navigation information both for [DVD] an audio video is shown in drawing 8 . As mentioned above, the audio video two ways DVD have an audio zone according to the video zone and DVD audio format according to a DVD video format. Refreshable information is with AV information (image information with voice), such as a movie, and audio information from the audio video two ways DVD. And when each information is reproduced by various players, the navigation information for making it neither derangement nor conflict arise is separately recorded on the top both for [DVD] an audio video corresponding to each player.

[0137] (4.3.1) In AMG, ATSI, and title search pointer table drawing 8 , the audio video two ways DVD have an audio zone and a video zone. An audio zone consists of AMG202, ATS#1, ATS#2, and ATS#3, ATS#1 consists of ATSI211 and AOB210, and ATS#3 consist of only ATSI(s)212. Moreover, a video zone consists of VMG3, VTS#1, and VTS#2, and VTS#1 consists of VTSI11 and VOB10.

[0138] AMG202 contains AMGI (AMG Information)240 which is the stereo part of navigation information. AMGI240 contains the AMGI management table 241 including the information on the file size of AMGI240, the record address, etc., the ATT search pointer table 242, and the AOTT search pointer table 243. ATT is the generic name of the title (AVTT/AOTT) both for image voice which consists of an audio-only title (AOTT) which consists of only audio information, a title (AVTT) only for images which consists of AV information, and AV information here.

[0139] Here, a search pointer is a pointer in which the record location on DVD of the playback control information (here, the thing of APGCI and PGCI is pointed out.) of each title is shown. As mentioned above, each title is constituted by stereo information, such as audio information and AV information, and the playback control information for reproducing combining those stereo information. This playback control information is recorded on ATSI in ATS, or VTSI in VTS. A search pointer is a pointer in which the record location in ATSI of the playback control information of each title or VTSI is shown. In addition, navigation information is the information for managing playback of each title, and is a concept which contains the above-mentioned search pointer with this operation gestalt.

[0140] The ATT search pointer table 242 is a table which described the navigation information in the case of reproducing each title both for [concerned / DVD] an audio video by the compatible player. On the other hand, the AOTT search pointer table 243 is a table which described the navigation information

in the case of reproducing each title both for [concerned / DVD] an audio video by the audio player. Moreover, the number of the search pointers which the ATT search pointer table 242 and the AOTT search pointer table 243 correspond 1:1 times, and are described in an ATT search pointer table is in agreement with the number of all the titles contained in the audio video two ways DVD concerned. For example, if a total of seven titles are contained in the audio video two ways DVD concerned as shown in drawing 6 , the frame which the search pointer corresponding to the seven title is described in the ATT search pointer table 242, and is not concerned with the class of the title but describes seven search pointers also to the AOTT search pointer table 243 will be prepared. And the frame of each table supports 1:1.

[0141] (4.3.1.1) An ATT_SRP audio title search pointer (ATT_SRP) is navigation information used in case the audio video two ways DVD are reproduced by the compatible player. Therefore, if the audio video two ways DVD are set, a compatible player will reproduce each title with reference to this ATT_SRP.

[0142] The example of the navigation information shown in drawing 8 is equivalent to the example both for [DVD] an audio video shown in drawing 6 R> 6, and, for title #1 and #3, the title (AVTT/AOTT) both for image voice, title #2, and #5 are [an audio-only title (AOTT), title #4, #6, and #7] the titles (AVTT) only for images.

[0143] As already stated, three kinds of titles (AOTT, AVTT/AOTT, AVTT) are recordable on the audio video two ways DVD. Therefore, with the audio video two ways DVD, the search pointer about all three kinds of titles (AOTT, AVTT/AOTT, AVTT) is described by the ATT search pointer table 242 of AMG.

[0144] However, the title search pointer 245 actually written to the ATT search pointer table 242 of drawing 8 is only an audio-only TAITORUSACHI pointer (AOTT_SRP) or a title search pointer (AVTT_SRP) only for images, and the title search pointer about the title (AVTT/AOTT) both for image voice is described as a title search pointer (AVTT_SRP) only for images (parenthesis writing shows actual description in the table of drawing 8). This is because there is no need of distinguishing the title (AVTT/AOTT) both for image voice and the title (AVTT) only for images for a compatible player. That is, it is because the compatible player has the ability to regenerate of a DVD video format, all the titles both for image voice are reproduced as AV information, so a navigation information top does not have the need of distinguishing from a video search pointer (AVTT_SRP), either. Therefore, all are described by format common as a title search pointer (AVTT_SRP) only for images for the title accompanied by playback of an image.

[0145] Therefore, so that it may turn out that the left column of drawing 6 and the audio title search pointer table 245 of drawing 8 are contrasted In the ATT search pointer table 242 which describes the navigation information for compatible players About the title only for images (6 title #4, 7), and the title both for image voice (1 title # 3), the title search pointer (AVTT_SRP) only for images is described. An AOTT search pointer (AOTT_SRP) is described about an audio-only title (2 title # 5). With reference to this table 242, as shown in the left column of drawing 6 , a compatible player reproduces title #1, and 3, 4, 6 and 7 as AV information, and reproduces title #2 and #5 as audio information.

[0146] (4.3.1.2) The navigation information for audio players is described by AOTT_SRP one side and the AOTT search pointer table 243. Therefore, a set both for [DVD] an audio video reproduces an audio player with reference to this AOTT search pointer table 243.

[0147] The search pointer about an audio title (AOTT) and the title (AVTT/AOTT) both for image voice is described by this table. Since an audio player does not have the ability to regenerate of AV information, description of the search pointer about the title (AVTT) only for images does not have the need. However, the search pointer actually written to this table is only an AOTT search pointer (AOTT_SRP). For an audio player, there is no need of distinguishing an audio title (AOTT) and the title (AVTT/AOTT) both for image voice that there should be only information about whether it is the title which can reproduce only voice. Therefore, on the audio-only TAITORUSACHI pointer table (AOTT_SRPT) 243, an audio title (AOTT) and the title (AVTT/AOTT) both for image voice are not distinguished, but all are described by format common as an AOTT search pointer (AOTT_SRP).

[0148] Therefore, although the title search pointer (AVTT_SRP) only for images is described within the above-mentioned ATT search pointer table 242 about the title (AVTT/AOTT) both for image voice, an audio-only TAITORUSACHI pointer (AOTT_SRP) will be described within the AOTT search pointer table 243.
[0149] In addition, about the title (AVTT) only for images, although only the frame which writes a title search pointer is prepared, ontic information is not described or the purport (audio playback cannot be performed) in which this title does not have AOTT_SRP is described. It is because the AOTT search pointer table 243 describes the navigation information for audio players and the audio player is impossible for playback of AV information. Therefore, an audio player judges that this title is unreproducible, and disregards this description.
[0150] With reference to the AOTT title search pointer table 243 described as mentioned above, an audio player performs playback shown in the right column of drawing 6 . Namely, title #4 only for images, and 6 and 7 are disregarded, and audio information is reproduced about title #1, and 2, 3 and 5.
[0151] (4.3.2) VMG, VTSI, and the title search pointer VMG3 contain VMGI (VMG Information) which is the stereo part of navigation information. VMGI contains the VMGI management table 250 including the information on the file size of VMGI, the record address, etc., and the title search pointer table (TT_SRPT) 251. The title search pointer table 251 is a table which described the navigation information about a video player. Therefore, a video player reproduces a title with reference to this title search pointer table (TT_SRPT) 251 according to the procedure for which it opted in the conventional video format. Therefore, it will be said that it is altogether described by the title search pointer table (TT_SRPT) 251 as TT_SRP, without distinguishing these two although a title here is two kinds, the title (AVTT/AOTT) both for image voice and the title (AVTT) only for images.
[0152] Thus, with the audio video two ways DVD, for an audio player, a video player, and each compatible player, the optimal navigation information is prepared and it is recording as three separate title search pointer tables. Thereby, the optimal playback can carry out according to the capacity of each regenerative apparatus.
[0153] (4.4) Give ****** explanation further about the structure of a search pointer table, next the structure of a search pointer table.
[0154] (4.4.1) ATT_SRP, AOTT_SRP, and the TT_SRPATT search pointer table 242 contain the ATT search pointer information 244 including information, such as the number of ATT search pointers, and two or more ATT search pointers 245. In addition, in drawing 8 , the inside of the parenthesis of each ATT search pointer shows the class of search pointer actually indicated as the search pointer concerned. The search pointer written to have mentioned above to the ATT search pointer table 242 is either AOTT_SRP or AVTT_SRP.
[0155] The AOTT search pointer table 243 contains the AOTT search pointer information 246 which includes information, such as the number of AOTT search pointers, similarly, and two or more AOTT search pointers 247. In drawing 8 , the class of search pointer with which the inside of **** of each AOTT search pointer is also actually described as the search pointer concerned is shown. As mentioned above, all the search pointers written to an AOTT search pointer table are AOTT_SRP.
[0156] The location on each search pointer table of the ATT search pointer which specifies the same title, and an AOTT search pointer must be the same. That is, the ATT search pointer on the ATT search pointer table 242 and the AOTT search pointer on the AOTT search pointer table 243 correspond by 1:1, and ATT_SRP#1 and AOTT_SRP#1 specify the same title.
[0157] TT search pointer table 251 contains TT search pointer information 252 which includes information, such as the number of TT search pointers, similarly, and two or more TT search pointers 254.
[0158] Although the ATT search pointer 245 and the AOTT search pointer 247 correspond by 1:1, between both and TT search pointer, the correspondence relation of 1:1 does not necessarily exist. However, TT search pointer is the same as an ATT search pointer and an AOTT search pointer at the point that the playback procedure is shown by PGC which constitutes the target title logically being shown.

[0159] (4.5) Classify and explain these titles for every refreshable player with reference to the playback approach of each title next drawing 6 , and 8 about each playback approach of three kinds of titles recordable on the audio video two ways DVD.
[0160] (4.5.1) An audio player and a compatible player can reproduce the playback approach AOTT of an audio-only title (AOTT). AOTT is a title for audio information playback. Moreover, there are the following in the main playback gestalten (function) of an audio-only title which it is going to realize or have relation by this invention. However, a realizable playback gestalt is also included in playback by the audio player of the title (AVTT/AOTT) both for image voice.
[0161] Multichannel playback: In a DVD audio format, a maximum of 8 ch is possible for the LPCM audio information on a video zone. As a discrete multichannel, a maximum of 6 ch is possible. In this case, 11 patterns are possible for a setup of 13 pattern a total of 24 patterns from the combination of the part of a discrete multichannel, and the signal for 2ch playback to each channel again from that of the combination of a two three front + back + subwoofer. 21 patterns are possible for the LPCM audio information on an audio zone in the combination of a two three front + back + subwoofer to the six-channel [a maximum of] possibility of and each channel.
[0162] 2ch playback: Reproduce the LPCM audio information on 2 or less ches as it is. The multichannel LPCM audio information on playback and an audio zone carries out a down mix at 2ch(es) based on the down mix multiplier separately defined per truck, and the multichannel LPCM audio information on a video zone reproduces only 2 ch of CH0 and CH1 as 2ch(es).
[0163] Audio selection: DVD can define the audio information on two different playback gestalten as one title, and a user can choose with it. This function is called audio selection. Specifically, a user can choose the playback gestalt from which 2ch(es) and a multichannel differed to the same music. Moreover, the audio information on LPCM record and the audio information recorded by other coding methods (compression voice, 1-bit voice, etc.) can be chosen to the music same as selection of those other than 2ch(es) and a multichannel, and it can also be heard.
[0164] Audio coding mode (Linear PCM, DORUBI AC 3, an MPEG audio, DTS, SDDS): The class of coding method at the time of recording audio information is shown. LPCM currently used also for CD is known well. Others are one of the compression coding methods.
[0165] Multichannel type: The class of multichannel record of LPCM in a DVD audio format is shown. In Type 1, a setup is possible up to a maximum of 6 ch. each channel -- ** -- the relation of loudspeaker arrangement can also be set up in the combination of a two three front + back + subwoofer.
[0166] Channel assignment (the number of channels, loudspeaker arrangement): Relation with the number of channels, and each channel and output loudspeaker arrangement in the multichannel of LPCM and the relation between each channel and a channel group are shown. for example, when the signal of 3ch is recorded, CH1 by which CH0 is contained in the channel group 1 by the signal outputted from the Left Front speaker:forward left is contained in the channel group 1 by the signal outputted from the Right Front speaker:forward right -- it is shown that CH2 is the relation of being the signal outputted from Surround speaker:back and being contained in the channel group 2. As mentioned above, in Type 1, a multichannel type is possible for a setup of 21 patterns in the combination of a two three front + back + subwoofer, and it is shown which combination channel assignment information is among these 21 patterns.
[0167] Multi-stream: Although the stereo information on the audio recorded on the audio range in a DVD audio format is recorded as an only audio stream into AOB, into VOB, for every pack, multiplex [of the stereo information on the audio recorded on a video field] is carried out, and it is recorded with the stream of an image. Moreover, if VOB is within the limits of the limited transfer rate, it can carry out multiplex [of two or more audio streams]. For example, it is also possible to carry out multiplex [of 2 ch/LPCM audio stream, and the multichannel / LPCM audio stream], or to carry out multiplex [of 2 ch/LPCM audio stream and the AC-3 compression voice stream]. A user can choose two audio streams from which these playback gestalten differ by specifying the value of audio selection.
[0168] (4.5.1.1) In the case of an audio player, first, explain how an audio player reproduces AOTT. As mentioned above, refer only to AOTT_SRPT243 for an audio player as navigation information.

Therefore, if it is going to reproduce title #2, with reference to AOTT_SRP#2, the ATS number (in this case, ATS#1) in which the title concerned is contained, and the title number within that ATS will be read (see drawing 8 and the pass shown by "P2A (1)"). Next, with reference to ATSI211 of corresponding ATS#1 (see drawing 8 and the pass shown by "P2A (2)"), A(Audio) PGCI to which the title concerned corresponds is read from the title number within previous ATS. Therefore, audio information is reproduced by reproducing the audio pack 43 in AOB210 according to APGCI specified by AOTT_SRP#2 at the time of playback (see drawing 8 and the pass shown by "P2A (3)").
[0169] (4.5.1.2) the case of a compatible player, next a compatible player reproduce AOTT -- give approach ****** explanation. Refer to ATT_SRPT242 for a compatible player as navigation information. Therefore, with reference to ATT_SRP#2, if it is going to reproduce title #2, since it is AOTT_SRP, it will recognize that the title concerned is AOTT. Henceforth, the ATS number (in this case, ATS#1) in which the title concerned is contained, and the title number within that ATS are read like an audio player (see the pass shown by drawing 8 and "P2C (1)"). Next, with reference to ATSI211 of corresponding ATS#1 (see the pass shown by drawing 8 and "P2C (2)"), APGCI to which the title concerned corresponds is read from the title number within previous ATS. Therefore, audio information is reproducible by reproducing the audio pack 43 in AOB210 according to APGCI specified by ATT_SRP#2 at the time of playback (see the pass shown by drawing 8 and "P2C (3)").
[0170] (4.5.2) The title only for images (AVTT)
Next, the reproductive pass of the title only for images is explained. The title only for images can reproduce a video player and a compatible player.
[0171] (4.5.2.1) In the case of a video player, a video player processes with reference to TT_SRPT (title search pointer table)251 according to the playback procedure of a video format as navigation information. Therefore, the title search pointer table 251 of VMG3 is referred to first. The description location of each title search pointer table 242 of a title which corresponds on audio navigation here, and the search pointer on 243, and the description location of the title search pointer on the title search pointer table 251 of VMG3 do not need to support 1:1. That is, in the ATT search pointer table 242 of AMGI, and TT search pointer table 251 of VMGI, the contents and sequence can be defined independently. However, in order to avoid derangement, suppose that a frame is packed and described on TT search pointer table in principle in the title search pointer table 251 when there is no title corresponding to TT_SRP254 of VMGI. Therefore, title numbers may differ, as drawing 8 shows. That is, although seven titles exist in the audio video two ways DVD of the example shown in drawing 6 , since title #2 whose a video player is AOTT, and #5 are not reproduced, TT_SRP about the five remaining titles (title #1, #3, #4, #6, #7) which excluded these has been described in the title search pointer table 251. therefore, each title # which shows TT_SRP#1-#5 in the title search pointer table 251 to drawing 6 , respectively -- 1, #3, #4, #6, and #7 are supported.
[0172] TT_SRP254 shows PGC which constitutes the target title logically. Therefore, a video player reads the VTS number (in this case, VTS#1) in which the title concerned is contained, and the title number within that VTS from this search pointer (see drawing 8 and the pass shown by "P3V(1)"). Next, with reference to VTSI11 of corresponding VTS#1 (see drawing 8 and the pass shown by "P3V(2)"), PGCI to which the title concerned corresponds is read from the title number within previous VTS. Therefore, a video player acquires this PGCI and reproduces the title concerned as AV information using the video pack in VOB, an audio pack, etc. (see drawing 8 and the pass shown by "P3V(3)").
[0173] (4.5.2.2) Explain pass the case of a compatible player, next in case a compatible player reproduces the title (AVTT) only for images. Refer only to ATT_SRPT242 for a compatible player as navigation information. Therefore, with reference to these ATT_SRP#4, since it is AVTT_SRP, it recognizes that the title concerned is a title only for images. As mentioned above, it is not in agreement with the title number in a video player. However, as the video player read from TT_SRPT, henceforth, the VTS number (in this case, VTS#1) in which the title concerned is contained, and the title number within that VTS are read from ATT_SRP245 (see the pass shown by drawing 8 and "P4C (1)"). Next, with reference to VTSI11 of corresponding VTS#1 (see the pass shown by drawing 8 and "P4C (2)"), PGCI to which the title concerned corresponds is read from the title number within previous VTS.

Therefore, a compatible player also acquires this PGCI and reproduces the title concerned as AV information using the video pack in VOB, an audio pack, etc. (see the pass shown by drawing 8 and "P4C (3)").
[0174] (4.5.2.3) Explain the case of an audio player, next the case of an audio player. Refer only to AOTT_SRPT243 for an audio player as navigation information. Therefore, although AOTT_SPR#4 are read, since it is written here that there is no corresponding AOTT, playback is stopped.
[0175] (4.5.3) In the case of the title (AVTT/AOTT) both for image voice, the title both for image voice is reproduced by the players of an audio player, a video player, and all compatible players. Therefore, it explains to this order.
[0176] (4.5.3.1) In the case of an audio player, first, explain how audio BUREYA reproduces the title both for image voice. Refer only to AOTT_SRPT243 for an audio player as navigation information. Therefore, with reference to AOTT_SRP#1, the ATS number (in this case, ATS#3) in which the title concerned is contained, and the title number within that ATS are read (see drawing 8 and the pass shown by "P1A (1)"). Next, with reference to ATSI212 of corresponding ATS#3 (see drawing 8 and the pass shown by "P1A (2)"), APGCI to which the title concerned corresponds is read from the title number within previous ATS. However, these ATS#3 show the playback procedure as opposed to VOB10 of VTS#1 in this APGCI, excluding the audio data as a stereo. Therefore, only audio information is reproduced by reproducing only the audio pack 43 in VOB10 according to this APGCI at the time of playback (see the pass shown by drawing 8 "P1A (3)").
[0177] (4.5.3.2) Explain the approach in which a video player carries out title playback both for image voice next in the case of a video player. As mentioned above, a video player is not concerned with the class of disk, but processes according to the playback procedure of a video format. Therefore, the title search pointer table 251 of VMG3 is referred to first. A title number here is #1 and is in agreement with the title number on audio navigation. Since future pass is the same as that of the case of (5.2.1), explanation is omitted. see drawing 8 and the pass shown by "P1V(1), (2), (3)")
(4.5.3.3) Explain the case of a compatible player, next how a compatible player reproduces the title both for image voice. Refer only to ATT_SRPT242 for a compatible player as navigation information. Therefore, with reference to this ATT_SRP#1, it recognizes that it is AVTT. Henceforth, as the video player read from TT_SRPT251, the VTS number (also in this case, it is VTS#1) in which the title concerned is contained, and the title number within that VTS are read from ATT_SRP245 (see the pass shown by drawing 8 and "P1C (1)"). Since future pass is the same as that of the case of a video player, explanation is omitted (see the pass shown by drawing 8 , "P1C (2), and P1C (3)).
[0178] As explained above, the conflict and derangement at the time of reproducing the title from which various playback gestalten differ by the various players from which the ability to regenerate differs can be lost by having the information which has the information which unifies them or it not only has the navigation information for videos, and the navigation information for audios, but associates them.
[0179] (5) As stated until now [of a title / management information], a user chooses the truck included a desired title group or there, and directs playback. A regenerative apparatus chooses automatically the title in which the title or the directed truck which constitutes the directed title group is included according to the capacity of a regenerative apparatus, and starts playback.
[0180] Furthermore, in the DVD audio format, when reproducing an audio title (AOTT) or the title (AVTT/AOTT) both for image voice by the audio player, it has the logical structure which can choose audio information. About the structure for realizing this function, that navigation information is first explained based on drawing 9 . Drawing 9 is the block diagram having shown in the detail the structure of ATS203 shown in drawing 3 or drawing 8 .
[0181] (5.1) ATSIATS203 consists of ATSI_BUP213 as AOTT_AOBS10' as ATSI211 as navigation information, and a settlement of audio stereo information (AOTT_AOB210), and backup of ATSI211, as mentioned above.
[0182] Moreover, ATSI211 consists of ATS_PGCIT271 which is ATSI_MAT270 as management information, and the table of playback control information, as shown in drawing 9 .
[0183] (5.1.1) Attribute information, a down mix multiplier, etc. about the address information and

audio stereo information on various tables are described by ATSI_MAT270 of ATSI_MAT management information.
[0184] (5.1.1) The coding method, a sampling frequency, a quantifying bit number, the number of channels, a multichannel type, a channel assignment, etc. are described every AOTT_AOB210 about AOTT_AOB210 contained in AOTT_AOBS210' by attribute information attribute information. Thus, when AOTT_AOBS210' is in ATS203, two or more kinds of audio information serves as here where it is separately recorded by being divided into AOTT_AOBS210' as another AOTT_AOB210. Moreover, there is also a thing without AOTT_AOBS210' in ATS203, and the attribute information about the audio stream of VOB (AOTT_VOB and AVTT_VOB)10 recorded on the video zone is described by the attribute information in this case. Therefore, when two or more kinds of audio information is recorded on VOB10 by VOB as two or more streams, the stream number and its attribute information are described for every stream here.
[0185] (5.1.2) ATS_PGCITATS_PGCIT271 consists of a table 275 of the search pointer (ATS_PGCI_SRP) 275 for looking for the playback control information corresponding to ATS_PGCITI272 and the title which describe the information about the whole playback control table, and a table 274 of playback control information (ATS_PGCI) 276 themselves.
[0186] (5.1.2.1) In ATS_PGCI_SRP this invention, while recording two or more audio information that classes differ on a disk, in order to deal with it as the same work and the same music about audio information with the candidate for sound recording common as a principle, as shown in drawing 10 and drawing 11 , PGC300 as management information was introduced and two or more audio information that classes differ in one title 261 is connected. Although later mentioned about the detail of the management method of the audio information using this PGC300, in connecting two or more audio information that classes differ in one title 261, in this invention, it has the logical structure which blocked PGC300.
[0187] And the playback control information of the audio stereo information managed by this PGC300 is ATS_PGCI276, and the information for looking for ATS_PGCI276 corresponding to each title 621 is described by ATS_PGCI_SRP275. For example, it is described every ATS_PGCI276 whether the PGC300 is an entry. An entry is information which shows that it is PGC300 representing a PGC block. Moreover, relation (under a head and a block, the last) in a PGC block, a block type, the number of channels, a coding method, the starting address of ATS_PGCI276, etc. are described [whether the title number in ATS203 and the PGC block are formed, and] by ATS_PGCI_SRP275 again.
[0188] As mentioned above, at the time of title playback initiation, it has explained that it has an ATS number and an ATS title number by AOTT_SRP247 of AMG202, and corresponding ATS_PGCI276 is acquired, but when ATS_PGCI_SRP275 of corresponding ATS203 of a number is seen, the location where ATS_PGCI276 corresponding to an ATS title number is recorded is known.
[0189] Moreover, when two or more audio information supports one title, two or more ATS_PGCI_SRP275 with the same ATS title number will exist. In this case, it will judge in accordance with other information (a block type, the number of channels, coding method), optimal PGC300 will be chosen, and playback will be started.
[0190] 1.2.2) ATS_PGCI276 as playback control information corresponding to each title constitutes the list and the table following the table of an ATS_PGCI search pointer.
[0191] In this invention, in order to manage audio stereo information by PGC300, as shown in drawing 10 or drawing 11 , the partition information of a program 301 is used. A program 301 is information which classifies the cel 220 mentioned above in playback units, such as one etc. music, and is the information corresponding to a truck 260. Therefore, PGC300 corresponding to a title 261 will manage 1 or two or more programs 301, and this information is described by ATS_PGCI276.
[0192] One ATS_PGCI276 consists of table ATS_PGIT291 which collected the information (ATS_PGC_GI) 290 about the PGC300 whole, and the information about each program 301 which constitutes the PGC300, and table ATS_C_PBIT292 which collected the information about each cel 220 which constitutes a program 301 further.
[0193] (5.1.2.2.1) **s, such as a start address of each table which continues after the number of

programs, the number of cels, PGC playback time amount, and this information, are described as information about this PGC300 whole by ATS_PGC_GIATS_PGC_GI290.
[0194] (5.1.2.2.2) Only in the number of programs, information ATS_PGI about this program 301 that constitutes PGC300 forms a list and table ATS_PGIT291 in order of the playback following ATS_PGITATS_PGC_GI290. Information, such as information for specifying the information for specifying the attribute of the information for continuation playback and the audio stereo information (AOB) which this program reproduces as one ATS_PGI, and a down mix multiplier, a cel number corresponding to a program head, Start PTS, and program playback time amount, is described.
[0195] With the information which specifies the attribute of this ATS_PGI, the detailed attribute information on this program can be acquired for the first time by specifying the attribute information on the audio stereo information mentioned above that it is written concretely in ATSI_MAT270, by the attribute number, and making both correspond. Since it is considering as the structure where this attribute number can be defined for every program, in the DVD audio format, it has the structure where an attribute can be changed for every music.
[0196] However, there is information about an attribute also in ATS_PGCI_SRP275. The attribute information described by ATS_PGCI_SRP275 is the information for choosing the audio stereo information that classes differ, and serves as description of only attribute information common to each program 301. Conversely, if it says, a coding method must be common in the flume which can set up an attribute freely by the program unit. Moreover, when a PGC block is constructed, it is necessary to protect limit of unifying them by 3 or more ches or all the programs 301 in PGC300 also unify the number of channels by 2 or less ches.
[0197] Moreover, the cel number corresponding to a program head shows with which cel 220 this program 301 corresponds.
[0198] (5.1.2.2.3) Only in the number of cels, information ATS_C_PBI about this cel that constitutes PGC300 forms list table ATS_C_PBIT292 in order of the playback following ATS_C_PBITATS_PGIT291. As for one ATS_C_PBI, an index number, a cel type, a start address, the address, etc. are recorded. The address on the disk of the audio stereo information corresponding to a title 261 is known for the first time here.
[0199] For example, suppose that the 3rd music of the title group 262 with a user was directed. This title group 262 presupposes that it consists of one title 261. Acquisition of ATS_PGCI corresponding to a title 261 is as having mentioned above. Since it is the 3rd music, 3rd ATS_PGIT291 corresponding to program #3 is read, and head cel number #n in it is acquired. Since, as for the program 301 (#3), it turned out that it starts from a cel 220 (#n), n-th ATS_C_PBI will be read, the start address described here will be acquired, it will jump there, and playback of the 3rd music will be started.
[0200] (5.2) Explain how the audio information from which two or more classes differ is recorded in the record approach of audio information, next this operation gestalt.
[0201] As explanation of the physical structure of each audio disk described, AOB210 as audio stereo information and VOB10 as AV stereo information are contained in ATS203 and VTS3, respectively. The stereo information furthermore reproduced as an audio title is also called ********, AOTT_AOB, and AOTT_VOB. It is AOTT_AOBS and AOTT_VOBS which considered two or more AOTT_AOB and AOTT_VOB as one settlement, respectively.
[0202] Audio information from which two or more classes differ, It is classified into three kinds shown below concretely.
[0203] a. Two or more audio information that sound recording situations differ (for example, **, such as sound recording, sound recording in the binaural sound recording and hole front, the sound recording in S seats and one spot sound recording, and sound recording usually according to a multi-microphone)
b. Two or more audio information that coding methods differ (for example, **, such as LPCM, MPEG, Dolby AC-3 and SDDS, and DTS)
c. two or more audio information sound recording situations that playback gestalten (the number of channels is 2 or less ches or 3 ches or more) differ, a coding method, a playback gestalt, and ** -- it can decide independently, respectively. However, two or more audio information that the target classes

differ here is audio information with the common candidate for sound recording in principle, and it should be treated as the same work (title) and the same music (truck). Two or more audio information that these classes differ is recorded by two kinds of different approaches on a disk.
[0204] (5.2.1) Even if it was the AOTT_VOBSDVD audio format with two or more audio streams, the recording method of audio information when image information follows was made into the same recording method as a DVD video format in order to take a DVD video format and transposition. So, when two or more audio information that classes differ with image information was recorded, we decided to carry out multiplex to the same stereo information (AOTT_VOB), and to record on it as another stream. As stated even in the place of a video format, image information and audio information are begun, subimage information etc. is defined by VOB10 as a respectively different stream, it is divided into it per pack (2048Bytes), respectively, multiplex is carried out to it in this unit, and it is recorded on a disk as one system stream.
[0205] As audio information, since a definition can be given to a maximum of eight kinds, it is recordable here as another stream with a stream number which is different in the audio information from which a class differs, respectively. When such a method of a recording method is taken, a DVD video format and transposition can be taken. Moreover, there is a merit that the class of audio information can be easily changed only by changing the stream which a regenerative apparatus processes at the time of playback. Furthermore, since it is recording on one stereo information when it sees as a video title, naturally it can treat as the same title and the same truck. Therefore, two or more different audio information, such as the number of channels, can be recorded appropriately, without giving derangement to a user.
[0206] However, the multiplex system of such a stream is unsuitable to an audio format. In a DVD disk, there is a limit that the sum total of the data transfer rate of all streams is indispensable at 10.08 or less Mbpses. Therefore, it cannot carry out multiplex [of the two streams as shown in the following table 1].
[0207]
[Table 1]

	Audio coding mode	fs	Qb	Number of Channel	Bit rate
Stream #1	LPCM	96k	24bit	2ch	4.608 Mbps
Stream #2	LPCM	48k	16bit	8ch	6.144 Mbps
Total					10.742 Mbps

[0208] In Audio DVD, since it is necessary to surely record incompressible LPCM voice, when a sampling frequency is high, or when there are many channels, the data transfer rate needed is high. Therefore, when audio information tends to be made into a subject and it is mainly going to record two or more incompressible LPCM voice, it can be said that the multiplex system of this stream is unsuitable.
[0209] Moreover, the function as an object for sound recording and adjustment with the studio device by which current use is carried out are thought as important for an audio format, and it is asked for especially the processing at the time of record being easy. If it will have the structure which makes a video stream the start like a DVD video format, and carries out multiplex [of the stream of two or more adjustable rates], management information must be placed into data. Moreover, it has structure which describes the address information about the data for several order minutes at this management information, and if it thinks as sound recording equipment, it is unrecordable on a disk in the data for several minutes of order not being assembled. Therefore, the problem that a simple sound recorder

cannot be constituted is produced. Moreover, authoring equipment new in addition to a current studio device is needed. There is also a said problem.

[0210] (5.2.2) When only two or more block AOTT_AOBS audio information was recorded, we made to solve the above-mentioned trouble into the more important technical problem, and decided to take the structure searched for as an audio format. Then, we decided to record only one kind of audio stream on one stereo information (AOTT_AOB), and when two or more audio information that classes differ was recorded, we decided to dissociate and record on another area on a disk as another stereo information (AOTT_AOB). By doing in this way, if the data transfer rate of one audio information is 10.08 or less Mbpses, it will serve as structure recordable without limit. Moreover, if there is the audio information by the data of a fixed rate like incompressible LPCM in order to record only one kind of audio stream, it is not necessary to place management information into data, and the processing at the time of record will also become easy.

[0211] Moreover, there is also no need of it not being necessary to reproduce the audio information on 2ch(es) and the audio information on a multichannel to coincidence and, and switching in an instant not much. Therefore, although the processing accompanying the switch at the time of playback will become complicated when it dissociated and records on another stereo information, it can be said that it is not a big problem.

[0212] However, the structure which treats two or more stereo information as the same title in this case is needed. Moreover, it is necessary to also treat systematically the audio information recorded on AOTT_VOB as two or more streams by the same structure.

[0213] (5.3) audio selection -- although it roughly divides into the approach of recording two or more audio information that classes differ, as mentioned above and there are two approaches among them, it is alike, respectively, it sets and there is a problem. Then, by giving the following logical structures to playback control information, this invention solved the problem in each approach, and enabled suitable audio selection. Switching-two or more audio information that class which needs to be treated as same title and which is recorded on area where it differs on disk differs from audio selection here ****.

[0214] first, in taking the approach of separating and recording on a disk two or more audio information that classes differ on another area as another stereo information (AOTT_AOB) As shown in drawing 10 , it is the recording method (in the case of drawing 10) of audio stereo information. Sound-recording gestalt: Two or more audio stereo information of each that 2ch differs from multi-ch (in this case, since it is an audio title) The cel 220 which constitutes each AOB210 is classified into the unit of the plug ram 301 as the 2nd partition unit to playback of AOTT_AOB210 (AOB#1, AOB#2). Moreover, each program 301 is identified with the program number (#1, #2, #3, --) as the 2nd partition information. In this program 301, it is a playback unit corresponding to a truck 260, for example, is equivalent to one music. Therefore, although recording methods differ, since the contents of each audio stereo information (AOTT_AOB210 (AOB#1, AOB#2)) are the same, the number and sequence of the program 301 about each audio stereo information become equal. In the case of drawing 10 R> 0, program #1, #2, and #3 will be consisted of, respectively.

[0215] Next, each program 301 (program #1, #2, #3) is summarized by blocked PGC300 (PGC#1, PGC#2) which is made into management information and which is each an exception. And the program 301 (program #1, #2, #3) including the audio stereo information that each recording methods differ is connected to the same truck 260 (#1) by making these PGC(s)300 (PGC#1, PGC#2) correspond to the same truck 261 (for it to be truck #1 in the case of drawing 10). That is, this invention is the audio stereo information on the program unit identified with the program number as the 2nd partition information. It is the truck 261 as the 1st partition unit identified in the audio stereo information that recording methods differ, respectively, with the track number (#1, #2, #3, --) as the 1st partition information. It has connected with the same truck 261 which has the same track number using separate PGC300 blocked as management information.

[0216] Two or more audio information that classes differ by doing in this way Even when taking the approach of separating and recording on another area on a disk as another stereo information (AOTT_AOB), from a user It is recognized as the same title and the same music, and two or more audio

stereo information that classes differ can be systematically treated by choosing PGC300 which manages the audio stereo information on a recording method which suited directions of a user or the capacity of a regenerative apparatus.
[0217] next, in taking the approach of recording the audio stereo information that a recording method changes with stream multiplex system on the record section of a video format As [show / in drawing 11] Audio stereo information AOTT_VOB10 (in the case of drawing 11 , it is VOB#1) Separate PGC300 (in the case of drawing 11 , it is PGC#1 and #2) which was blocked and was prepared in each recording method (sound-recording gestalt: the case of drawing 11 2 ch and multi-ch) of every is used, and it is related ****** to the same truck 261 (in the case of drawing 11 , it is truck #1). In addition, each PGC300 of the point of managing a program 301 (it being program #1, #2, and #3 in the case of drawing 11) is the same as that of the case of drawing 10 .
[0218] The audio information on a desired recording method can be appropriately reproduced only by choosing PGC300 according to a recording method, without carrying out the direct reference of the navigation information in an audio stream, since the recording method of each audio stereo information is managed by each PGC300 by taking such the logical structure. That is, according to this invention, the audio information recorded in the video format is manageable by the control information of an audio format. Of course, from a user, it is recognized as the same title and the same music even in this case. Therefore, two or more audio information that classes differ can be systematically treated by choosing PGC which suited directions of a user or the capacity of a regenerative apparatus.
[0219] As mentioned above, audio selection can be performed by the structure same (when reproducing the title both for image voice) even when audio information is recorded on AOTT_AOB according to this invention, and even when recorded on AOTT_VOB (when reproducing an audio title), and this invention is effective when reproducing an audio title (AOTT) or the title (AVTT/AOTT) both for image voice by the audio player.
[0220] It explains how furthermore, this audio selection is performed in a concrete example using drawing 12 and 13.
[0221] (5.3.1) Explain to the audio selection beginning in an audio title the case where an audio title is reproduced with an audio player or a compatible player. Here, all title groups shall consist of one title. A regenerative apparatus is only for 2ch(es), or suppose that it has set up so that a user may choose 2ch playback. Moreover, suppose that the user directed the title group's 262 (#j) rebirth.
[0222] As mentioned above, the ATS number and ATS title number of a title corresponding to the title group 262 acquire with reference to AOTT_SRP247 (refer to drawing 8). As a result, an ATS number presupposes that #2 and an ATS title number were #3. the case of an audio (4.5.1.1) player, and (4.5.1.2) in the case of a compatible player, the flow so far is as having come out and explained.
[0223] Next, ATSI211 of ATS#2 is read and the attribute information currently written to ATSI_MAT270 is memorized (see the pass shown by drawing 12 and "P12 (1)"). In this phase, the attribute of each truck of the title which it is going to reproduce cannot be specified. All attribute information is memorized for the time being.
[0224] Then, ATS_PGCIT271 is read and it goes the PGCI search pointer (ATS_PGCI_SRP) 273 in this to reading (see the pass shown by drawing 12 and "P12 (2)"). An ATS title number (ATS_TTN) looks for ATS_PGCI_SRP273 of #3 in this table. In this case, it turns out that ATS_PGCI_SRP273 of #3 constitutes [the ATS title number as the 1st partition information] those (#3 and #4) with two, and a PGC block. Then, it judges PGCwhich 300 is chosen. In this case, a regenerative apparatus is only for 2ch(es), or since it is set up so that a user may choose 2ch playback, a book type item is seen. the PGC block is constructed by the difference in the number of channels here -- since it is written -- a degree -- Audio PGC300 of the direction which sees the item 284 (refer to drawing 9 and drawing 12) of channels, and is written to be 2 or less ches is chosen. And the address (in this case, 16384) with which playback control information ATS_PGCI276 of selected PGC300 is written is acquired, it jumps there, and playback control information is read and memorized (see the pass shown by drawing 12 and "P12 (3)").
[0225] The information table about a program 301 corresponding to a truck 260 and the information

table about a cel 220 are in playback control information. In starting playback from a title head, ATS_PGI of program #1 is seen, the attribute information previously remembered to be the information which specifies the attribute of program #1 is used, and it specifies the attribute of program #1. An audio decoder is set according to this attribute. Next, from ATS_PGI, the head cel number of program #1 is read (since it is program #1 that it is going to reproduce in this case, naturally that head cel number is also #1.), the address with which the cel 220 is recorded is read in ATS_C_PBI corresponding to that number, it jumps there, and playback is started (see the pass shown by drawing 12 and "P12 (4)").
[0226] Usually, in playback, playback of a cel is continued using ATS_C_PBI memorized by the memory under playback until it becomes the following program. If playback of a program finishes, using ATS_PGI and attribute information in memory, this will also perform a series of processings for the next program playback, and will start playback. This actuation is repeated till title termination. Therefore, as mentioned above, all the attribute information and playback control information ATS_PGCI in management information must be memorized.
[0227] next, a regenerative apparatus -- multichannel playback -- corresponding -- **** -- in addition -- and suppose that it has set up so that a user may choose multichannel playback. Moreover, suppose that the user directed the title group's 262 (#j) rebirth.
[0228] ATS number #2 of the title corresponding to the title group 262 and ATS title number #3 are acquired, and ATSI211 of ATS#2 is read and it goes. It is the same as the case where 2ch playback is chosen so far (see drawing 12 R> 2 and the pass shown by "P1M(1)"). Moreover, the attribute information currently written to ATSI_MAT270 of ATSI211 is memorized, ATS_PGCIT271 is read, and it goes the ATS_PGC search pointer 273 in this to reading (see drawing 12 and the pass shown by "P1M(2)"). There are not a case where the processing so far also chooses 2ch playback, and a change.
[0229] An ATS title number (ATS_TTN) looks for ATS_PGC_SRP273 of #3 in this table. In this case, it turns out that ATS_PGCI_SRP of #3 constitutes [the ATS title number] the PGC block with two (#3 and #4). Then, it judges PGCwhich 300 is chosen. in this case, a regenerative apparatus -- multichannel playback -- corresponding -- **** -- in addition -- and since it has set up so that a user may choose multichannel playback, a book type item is seen. Since it is written here that the PGC block is constructed by the difference in the number of channels, it is Audio next. PGC300 of the direction which sees the item 284 of channels and is written to be 3 or more ches is chosen. And the address (in this case, 24576) with which playback control information ATS_PGCI276 of selected PGC300 is written is acquired, it jumps there, and playback control information is read and memorized (see drawing 12 and the pass shown by "P1M(3)").
[0230] Future processings are fundamentally [as the case where 2ch playback is chosen] the same, except that PGC(s)300 to process differ and the stereo information to reproduce differs. ATS_PGI of program #1 is seen from the information table about the program in playback control information, the attribute of program #1 is specified, and an audio decoder is set. Next, ATS_C_PBI of head cel number #1 of program #1 is read, the address with which cel #1 is recorded is read in ATS_PGI, it jumps there, and playback is started (see drawing 1212 and the pass shown by "P1M(4)").
[0231] (5.3.2) Explain the case where the title both for audio selection image voice in the title both for image voice is reproduced by the audio player. Here, all the title groups 262 shall consist of one title. A regenerative apparatus is only for LPCM(s), or suppose that it has set up so that a user may choose playback of LPCM. Moreover, suppose that the user directed the title group's 262 (#j) rebirth.
[0232] As mentioned above, the ATS number and ATS title number of a title 261 corresponding to the title group 262 are acquired with reference to AOTT_SRP247. As a result, an ATS number presupposes that #2 and an ATS title number were #4. The flow so far is as having explained in the case of an audio (4.5.3.1) player.
[0233] Next, ATSI212 of ATS#2 is read and the attribute information currently written to ATSI_MAT270 is memorized (see drawing 13 and the pass shown by "P2L (1)"). In this phase, the attribute of each truck of the title which it is going to reproduce cannot be specified. All attribute information is memorized for the time being. Moreover, since it is going to reproduce the title both for image voice in this case, corresponding ATS203 is ATS of only navigation information without stereo

information.
[0234] Then, ATS_PGCIT271 is read and it goes the PGCI search pointer 273 in this to reading (see drawing 13 and the pass shown by "P2L (2)"). An ATS title number (ATS_TTN) looks for ATS_PGCI_SRP273 of #4 in this table. In this case, it turns out that ATS_PGCI_SRP273 of #4 constitutes [the ATS title number] the PGC block with two (#4 and #5). Then, it judges PGCwhich 300 is chosen.
[0235] In this case, a regenerative apparatus is only for LPCM(s), or since it has set up so that a user may choose playback of LPCM, a BURROKU type item is seen. Since it is written here that the PGC block is constructed by the difference between the number of channels and a coding method, it is Audio next. coding PGC300 of the direction which sees the item 285 of mode and is written to be LPCM is chosen.
[0236] Next, the address (in this case, 24576) with which playback control information ATS_PGCI276 of selected PGC is written is acquired, it jumps there, and playback control information is read and memorized (see drawing 13 and the pass shown by "P2L (3)").
[0237] The information table about a program 301 corresponding to a truck 261 and the information table about a cel 220 are in playback control information. In starting playback from a title head, ATS_PGI of program #1 is seen and it specifies the attribute of program #1 using the attribute information previously remembered to be the information which specifies the attribute of program #1. An audio decoder is set according to this attribute. Next, from ATS_PGI, the head cel number of program #1 is read (since it is program #1 that it is going to reproduce in this case, naturally that head cel number is also #1.), the address with which the cel is recorded is read in ATS_C_PBI corresponding to that number, it jumps there, and playback is started (see drawing 13 and the pass shown by "P2L (4)").
[0238] Usually, in playback, playback of a cel is continued using ATS_C_PBI memorized by the memory under playback until it becomes the following program. If playback of a program finishes, using ATS_PGI and attribute information in memory, this will also perform a series of processings for the next program playback, and will start playback. This actuation is repeated till title termination. Therefore, as mentioned above, all the attribute information and playback control information ATS_PGCI in management information must be memorized.
[0239] Next, the regenerative apparatus supports multichannel playback and AC-3 (a kind of a coding method: Dolby Digital), and suppose that it has set up so that a user may choose playback of AC-3. Moreover, suppose that the user directed the title group's 262 (#j) rebirth.
[0240] ATS number #2 of the title 261 corresponding to the title group 262 and ATS title number #4 are acquired, and ATSI211 of ATS#2 is read and it goes. It is the same as the case where LPCM playback is chosen so far (see drawing 13 and the pass shown by "P2A (1)"). Moreover, the attribute information currently written to ATS_MAT270 of ATSI211 is memorized, ATS_PGCIT271 is read, and it goes the ATS_PGC search pointer 273 in this to reading (see drawing 13 and the pass shown by "P2A (2)"). There are not a case where the processing so far also chooses LPCM playback, and a change.
[0241] An ATS title number (ATS_TTN) looks for PGC300 of #4 in this table. In this case, it turns out that PGC of #4 constitutes [the ATS title number] the PGC block with two. Then, it judges PGCwhich 300 is chosen.
[0242] In this case, the regenerative apparatus supports multichannel playback and AC-3, and since it has set up so that a user may choose playback of AC-3, a book type item is seen. the PGC block is constructed by the difference between the number of channels, and a coding method here -- since it is written -- a degree -- Audio coding PGC of the direction which sees the item 285 of mode and is written to be AC-3 is chosen. And the address (in this case, 32768) with which playback control information ATS_PGCI276 of selected PGC is written is acquired, it jumps there, and playback control information is read and memorized (see drawing 13 and the pass shown by "P2A (3)").
[0243] Future processings are fundamentally [as the case where LPCM playback is chosen] the same, except that PGC(s) to process differ and the streams to reproduce differ. ATS_PGI of program #1 is seen from the information table about the program in playback control information, the attribute of PG#1 is

specified, and an audio decoder is set. Next, ATS_C_PBI of head cel number #1 of program #1 is read, the address with which cel #1 is recorded is read in ATS_PGI, it jumps there, and playback is started (see drawing 13 and the pass shown by "P2A (4)"). However, since the stereo information (AOTT VOB) reproduced in this case is the same, the address of a jump place also becomes the same as the case where playback of LPCM is chosen.

[0244] (6) As shown in regenerative-apparatus (6.1) video DVD player drawing 14 , the video DVD player concerning the gestalt of operation Pickup 80, the recovery correction section 81, and the stream switches 82 and 84, A track buffer 83, a system buffer 85, and a demultiplexer 86, The VBV (Video Buffer Verifier) buffer 87, The video decoder 88, the subpicture buffer 89, and the subpicture decoder 90, It is constituted by a mixer 91, the audio buffer 92, the audio decoder 93, the input section 98, a display 99, the system controller 100, the drive controller 101, the spindle motor 102, and the slider motor 103. In addition, the configuration shown in drawing 14 indicates only an image and the part about audio playback among the configurations of a video DVD player, and since the servo circuit for carrying out servo control of the slider motor 103 grade to pickup 80 and spindle motor 102 list etc. is the same as that of the conventional technique, a publication and details explanation are omitted.

[0245] Next, actuation is explained.

[0246] Pickup 80 receives the reflected light from DVD1 of the light beam B concerned, and outputs the detecting signal Sp corresponding to the information pit currently formed on DVD1 while it irradiates light beam B as a playback light to DVD1 including the laser diode which is not illustrated, a beam splitter, an objective lens, a photodetector, etc. While light beam B is correctly irradiated to the code track on DVD1 at this time, tracking servo control and focus servo control are performed by the same approach as the conventional technique to the objective lens which is not illustrated so that a focus may be correctly connected with the information recording surface on DVD1.

[0247] It is inputted into the recovery correction section 81, and recovery processing and error correction processing are performed, the recovery signal Sdm is generated, and the detecting signal Sp outputted from pickup 80 is outputted to the stream switch 82 and a system buffer 85.

[0248] The stream switch 82 into which the recovery signal Sdm was inputted is the switch signal Ssw1 from the drive controller 101. The closing motion is controlled, and when it is close, through [of the inputted recovery signal Sdm] is carried out as it is, and it outputs to a track buffer 83. On the other hand, when the stream switch 82 is open, the recovery signal Sdm is not outputted and unnecessary information (signal) is not inputted into a track buffer 83.

[0249] The track buffer 83 into which the recovery signal Sdm is inputted outputs the memorized recovery signal Sdm continuously, when the stream switch 84 is made close, while being constituted by FIFO (First In First Out) memory etc. and memorizing the inputted recovery signal Sdm temporarily.

[0250] The stream switch 84 into which the recovery signal Sdm is inputted continuously is the switch signal Ssw2 from a system controller 100 so that various latter buffers may overflow, or it may become empty conversely and decoding may not be interrupted in the separation processing in a demultiplexer 86. Closing motion is controlled.

[0251] On the other hand, the system buffer 85 into which the recovery signal Sdm is inputted in parallel to a track buffer 83 the management information (VMG2 grade) about the whole information which is first detected when loading of DVD1 is carried out, and is recorded on DVD1, or VTS11 for every VTS3 -- accumulating -- control information Sc ******, while outputting to a system controller 100 The DSI data 51 for every Navi-pack 41 are temporarily stored during playback, and it outputs to a system controller 100 as control information Sc.

[0252] Through the stream switch 84, in the demultiplexer 86 inputted continuously, the recovery signal Sdm extracts a video data, audio data, subpicture data, and the PCI data for every Navi-pack from the recovery signal Sdm concerned for every pack, and outputs to the VBV buffer 87, the subpicture buffer 89, and the audio buffer 92 as a PCI signal Spc at a video signal Sv, the subvideo signal Ssp, and an audio signal Sad list, respectively.

[0253] At this time, a demultiplexer 86 extracts a pack header, a packet header, etc. from each pack (the audio pack 43 is included.) and a packet, and outputs them to a system controller 100 by making into the

header signal Shd information included in each.
[0254] Video signal Sv It is constituted by the FIFO memory etc. and the VBV buffer 87 inputted is a video signal Sv. It accumulates temporarily and outputs to the video decoder 88. The VBV buffer 87 is the video signal Sv compressed by the MPEG 2 method. It is for compensating dispersion in the amount of data of each picture (refer to drawing 2) of every [which can be set]. And video signal Sv with which dispersion in the amount of data was compensated It is inputted into the video decoder 88, a recovery is performed by the MPEG 2 method, and it is outputted to a mixer 91 as a recovery video signal Svd.
[0255] On the other hand, the subpicture buffer 89 into which the subvideo signal Ssp is inputted accumulates the inputted subvideo signal Ssp temporarily, and outputs it to the subpicture decoder 90. The subpicture buffer 89 is for outputting the subpicture data 44 contained in the subvideo signal Ssp synchronizing with the video data 42 corresponding to the subpicture data 44 concerned. And the subvideo signal Ssp with which the synchronization with a video data 42 was taken is inputted into the subpicture decoder 90, a recovery is performed, and it is the recovery secondary video signal Sspd. It carries out and is outputted to a mixer 91.
[0256] It is mixed by the mixer 91 and the recovery secondary video signal Sspd (the synchronization with the corresponding recovery video signal Svd can be taken.) outputted from the recovery video signal Svd and the subpicture decoder 90 which were outputted from the video decoder 88 is outputted to displays, such as CRT (Cathod Ray Tube) which is not illustrated as a final video signal Svp which should be displayed.
[0257] The audio buffer 92 into which an audio signal Sad is inputted is constituted by the FIFO memory etc., accumulates the inputted audio signal Sad temporarily, and outputs it to the audio decoder 93. The audio buffer 92 is the video signal Sv including the image information which corresponds an audio signal Sad based on the header control signal Shc outputted from a system controller 100. Or an audio signal Sad is delayed according to the output situation of image information of being for making it outputting synchronizing with the subvideo signal Ssp, and corresponding. And the audio signal Sad by which timing was carried out so that it might synchronize with corresponding image information is outputted to the loudspeaker which regeneration in a linear PCM system is given and is not illustrated as recovery audio signal Sadd based on the header control signal Shc which is outputted to the audio decoder 93 and outputted from a system controller 100. In addition, in the audio DVD only including music information, synchronous processing with image information is unnecessary.
[0258] (6.2) Explain an audio DVD player, next an above-mentioned audio DVD player with reference to drawing 15 . As shown in drawing 15 , an audio DVD player has the same configuration except it, although the configurations of the latter part of a demultiplexer 86 differ as compared with the video DVD player shown in drawing 14 . Therefore, the component after a demultiplexer 86 is explained.
[0259] Through the stream switch 84, in the demultiplexer 86 inputted continuously, the recovery signal Sdm extracts audio information from the recovery signal Sdm concerned for every pack, and outputs to the audio buffer 92 as an audio signal Sad.
[0260] The audio buffer 92 into which an audio signal Sad is inputted is constituted by the FIFO memory etc., accumulates the inputted audio signal Sad temporarily, and outputs it to the audio decoder 93. An audio signal Sad is inputted into the audio decoder 93, and is outputted to the loudspeaker which regeneration in a linear PCM system etc. is given and is not illustrated as recovery audio signal Sadd based on the control signal Shc outputted from a system controller 100.
[0261] For example, real-time information, such as a real-time text, is outputted to a RTI buffer from a demultiplexer. Based on the control signal Shc outputted from a system controller 100, the data temporarily stored in RTI Bachar are outputted to a RTI decoder, and display words etc. on the display which is not illustrated.
[0262] When it is detected that there is the need (a pause is carried out) of interrupting voice temporarily in the playback immediately after access to the information on desired etc., the pause signal Sca is outputted to the audio decoder 93 from a system controller 100, and the audio decoder 93 concerned suspends the output of recovery audio signal Sadd temporarily.

[0263] The configuration of the audio decoder 93 is shown in drawing 16 . The audio decoder 93 is equipped with the signal-processing section 120 containing a digital filter etc., D/A converter 121, the analog output circuit 122 containing amplifier etc., the digitized output circuit 123, the system microcomputer 124 containing RAM124a, and the clock circuit 125 like illustration.
[0264] The system microcomputer 124 exchanges a control signal Sca between system controllers 100, and performs motion control of the clock circuit 125, the signal-processing section 120, D/A converter 121, and the analog output circuit 122. The system microcomputer 124 has RAM124a inside. RAM124a memorizes temporarily the audio attribute information supplied as a control signal Sca from a system controller 100. The system microcomputer 124 supplies the contents to the clock circuit 125 and the signal-processing section 120 with reference to the audio attribute information memorized in RAM124a. Specifically, the system microcomputer 124 supplies the sampling frequency information in audio attribute information to the clock circuit 125. The clock circuit 125 has an oscillator and supplies the clock signal fs corresponding to the directed sampling frequency to the signal-processing section 120. Moreover, the system microcomputer 124 supplies the information on the existence of the sampling frequency in audio attribute information, a quantifying bit number, the number of channels, and emphasis to the signal-processing section 120, and offers the number information of channels to D/A converter 121. Furthermore, the system microcomputer 124 supplies information, such as amplification degree of the signal of each channel, to the analog output circuit 122. The information on the amplification degree for every channel can be included in audio attribute information, and can be supplied from a system controller 100.
[0265] The signal-processing section 120 uses the clock signal fs from the clock circuit 125, processes decode of the audio signal supplied from the audio buffer 92, a band limit, etc. according to information, such as coding methods (Linear PCM or DORUBI AC 3) obtained from the system microcomputer 124, a sampling frequency, and a quantifying bit number, further, performs de-emphasis processing according to the information on the existence of emphasis, and outputs it to D/A converter 121. D/A converter 121 divides the inputted signal for every channel according to the channel information acquired from the system microcomputer 124, and outputs it to the analog output circuit 122 as an analog signal for every channel further. Moreover, the signal-processing section 120 outputs digital audio signal Sadd to the exterior through the digitized output circuit 123.
[0266] (6.3) Although a compatible DVD player compatible DVD player does not illustrate, it constitutes a system controller 100 so that playback of both a video format and an audio format may be possible, while it equips the audio DVD player shown in drawing 15 with the VBV buffer 87 in the video DVD player shown in drawing 14 , the video decoder 88, the subPIKUCHIA buffer 89, the subPIKUCHIA decoder 90, and a mixer 91.
[0267] (7) The audio selection in the audio selection regenerative apparatus in a regenerative apparatus means switching the class of audio information to reproduce, when an audio player reproduces an audio title or the title both for image voice.
[0268] As a class of audio information, it is the record approach of audio (5.2) information, and as explained, it is mainly classified into the following three kinds.
[0269] a. When a block is constructed according to a sound recording situation b. coding method c. playback gestalt (7.1) sound recording situation (binaural) and sound recording situations differ, there is no need, such as initial setting, that what is necessary is just to always switch according to liking of a user regardless of the capacity of equipment. Moreover, case [like binaural sound recording], a regenerative apparatus is able to carry out a switch method as shown below.
[0270] Here, the binaural sound recording for realizing binaural playback is explained in detail.
[0271] The case where the usual stereo signal is first reproduced by headphone is considered. For example, as shown in drawing (A), two microphones are arranged in the predetermined location of a concert hall, and the output of these microphones is reproduced by headphone. In this case, playback sound field will be made at a listener's regio occipitalis capitis, as a slash shows to drawing 17 (A). In order that an image may orientate this to a loudspeaker completely [while] at the usual stereophonic reproduction tone place which used the loudspeaker, the level difference of a loudspeaker on either side

is for orientating completely [while] with about 10dB level difference to about 25dB being needed at a lug in headphone listening. Thus, when the usual music by which stereophonic recording was carried out is listened to by headphone, a feeling of a stereo sticks out too far strongly, and there is a problem that natural presence is not obtained.
[0272] On the other hand, in binaural playback, as a dummy head with an acoustic impedance almost equal to actual human being and an equal property is prepared, a microphone is prepared on the outskirts of external auditory meatus of both the lugs of this dummy head and it is shown in drawing 17 (B), this dummy head is put on the seat for audience of a concert hall, and the output of the microphone in a dummy head is reproduced by headphone. If such binaural playback is performed, the sound field reproduced around a listener's head will serve as range shown with the slash of drawing 17 R> 7 (A). Therefore, more natural presence can be obtained in listening by headphone or the earphone.
[0273] In order to realize such binaural playback, the above dummy heads are used, binaural sound recording records music, and suitable playback according to a listening gestalt can be performed by carrying out multiplex [of both such a work by which binaural sound recording was carried out, and the work by which stereophonic recording was carried out], and recording it on the DVD disk, as shown in drawing 18 . In addition, the record approach is not restricted to multiplex system and you may make it record the audio stereo information by which stereophonic recording was carried out, and the audio stereo information by which binaural sound recording was carried out on respectively different AOB210.
[0274] The judgment of whether to perform binaural playback formed the headset jack 400 in the regenerative apparatus at drawing 15 , as a dotted line showed, and it decided to carry out by whether the plug of headphone was inserted in this headset jack 400.
[0275] It is circuitry like drawing 19 , and gets down, and, as for this headset jack 400, the switch section 401 pushed up by contact to the plug of headphone is formed in both the upper part of a plug, and the lower part. And by pushing up these switch sections 401, the switch section 401 will be in an open condition, and it can detect that the plug was inserted.
[0276] If the plug of headphone is inserted in a headset jack 400 by such configuration and assignment of a certain music is performed by the user, PGC300 which manages the audio stereo information by which binaural sound recording was carried out with a procedure which was mentioned above will be chosen, and the audio stereo information by which binaural sound recording was carried out will be reproduced automatically.
[0277] Therefore, a user only inserts the plug of headphone in a headset jack 400, and can listen to the music of the request by which binaural sound recording was carried out.
[0278] In addition, detection of whether the plug of headphone was inserted in the headset jack 400 can be performed to the proper timing of the playback middle class at the time of playback initiation. Moreover, when the plug of headphone is inserted in a headset jack 400, the audio stereo information by which double NORARU sound recording was always carried out may not be chosen, but the setting actuation by the input section 98 shown in drawing 15 may constitute so that a user may set up priority. For example, when having set high priority as playback of stereophonic recording, a user can hear the audio stereo information by which stereophonic recording was carried out by headphone.
[0279] (7.2) A sound cannot be heard unless the regenerative apparatus supports the coding method of the audio information currently recorded on the disk, when a block is constructed with a coding method and coding methods differ (unless it has a corresponding decoder). In such the condition, a user gets confused. Therefore, it is decided that the audio information on LPCM is recorded by all disks and that playback all whose regenerative apparatus are LPCM(s) can be performed. Therefore, no matter a user may be what audio DVD disk, only the audio information by which LPCM record was carried out is reproducible.
[0280] On the other hand, the coding method of current various kinds is put in practical use. These many are compression coding methods, and when recording especially a multichannel, it has the description that data can be used effectively. Thus, only when it has the decoder to which a regenerative apparatus corresponds when there is audio information recorded by various coding methods according to the

purpose, it can choose and reproduce out of it. In this case, a regenerative apparatus is in ATS_PGCI_SRP273 explained previously according to a temporary setup by the user, initialization by the user, and a setup by the regenerative apparatus. It reproduces by choosing the optimal audio information according to the flow chart shown in drawing 19 , judging from the information which shows the coding method currently written to the item 285 of Audio coding mode.

[0281] In addition, each setting processing can be constituted so that the input section 98 shown in drawing 14 or drawing 15 may perform. Furthermore, the set-up information can be constituted so that the memory in a system controller 100 may memorize.

[0282] Moreover, when a DVD disk is set in a regenerative apparatus, or in case it is going to start playback, the control information recorded on the DVD disk as having mentioned above can be read with a system controller 100, and a sound recording gestalt, a playback gestalt, or a coding method of the audio stereo information recorded on the DVD disk etc. can also be constituted so that it may display on a display 99. By such configuration, a user can **, can know a selectable setup appropriately in a DVD disk, and can perform suitable selection actuation.

[0283] An example of the processing which chooses PGC from the information which shows a coding method hereafter according to the flow chart shown in drawing 19 is explained.

[0284] First, initiation of selection processing describes reading of ATS_PGCI_SRP273 in a line crack (step S2) and ATS_PGCI_SRP273 (step S1). The coding method currently written to the item 285 of Audio coding mode is read (step S3). Next, it judges whether there is any capacity for a regenerative apparatus to perform playback by the read coding method (step S4). consequently -- the case where there is no capacity to perform playback by the read coding method in a regenerative apparatus -- (step S4; No) -- the processing from reading of ATS_PGCI_SRP273 is repeated again (step S2-). When there is capacity for a regenerative apparatus to, perform playback by the read coding method on the other hand, it judges whether the user has chosen (step S4; Yes) and the read coding method as a temporary setup (step S5). In case playback is started for example, with remote control equipment etc., this setup is performed during playback, and when it is going to reproduce with a coding method which is different from the existing setup about specific music, it is performed. As a result of said judgment, when the user has chosen the read coding method as a temporary setup, (step S5; Yes) and selection processing are ended, PGC300 which ATS_PGCI_SRP273 concerned shows is chosen, and playback is started (step S8).

[0285] However, when the user has not chosen the read coding method as a temporary setup, it judges whether the user has chosen (step S5; No) and the read coding method as initial setting (step S6). If this initial setting holds the fundamental coding method of a regenerative apparatus according to liking of user confidence etc. and this initial setting is performed, unless a temporary setup mentioned above will be performed, it will be reproduced by the coding method by which all music was initialized. That is, when the user has chosen the read coding method as initial setting, (step S6; Yes) and selection processing are ended, PGC300 which ATS_PGCI_SRP273 concerned shows is chosen, and playback is started (step S8).

[0286] Moreover, when the user has not chosen the read coding method as initial setting, it judges whether (step S6; No) and the read coding method have chosen as a setup of a regenerative apparatus (step S7). Unless this setup is performed in the manufacture phase of a regenerative apparatus and various setup by the user mentioned above is performed, all music will be reproduced by this set-up coding method. That is, when the read coding method has chosen as a setup of a regenerative apparatus, it ends (step S7; Yes) and selection processing, it chooses PGC which ATS_PGCI_SRP273 concerned shows, and starts playback (step S8).

[0287] in addition -- the case where the read coding method is not chosen by the error of reading data etc. as a setup of a regenerative apparatus -- (step S7; No) -- the processing from reading of ATS_PGCI_SRP273 is repeated again (step 2-).

[0288] (7.2) When a block is constructed according to a playback gestalt, selection of a playback gestalt here means choosing whether 2ch (stereo) playback is performed or multichannel playback is performed. When the regenerative apparatus supports the multichannel, the audio information on

multichannel record can be chosen and it can reproduce. However, the user has the system (two or more amplifier and loudspeakers) which can reproduce a multichannel, and only when this regenerative apparatus is connected to the system, playback as an original multichannel can be performed. therefore, it is described by ATS_PGCI_SRP273 previously explained also in this case according to a temporary setup by the user, initialization by the user, and a setup by the regenerative apparatus Judging from the information which shows the number of channels currently written to the item 284 of Audio channels, according to the same flow as the flow chart which boiled previously and was shown, it reproduces by choosing the optimal audio information.

[0289] (7.3) When a block is constructed according to a coding method and a playback gestalt, as the example of drawing 12 also showed, a coding method may differ from both playback gestalt as a difference in the class of audio information within a block. In such a case, the following processings are needed.

[0290] Priority is set up to all the combination of each coding method which can process a regenerative apparatus, and each playback gestalt. An example is shown in Table 2. Such a setup is carried out as [be / possible] if needed by each setup of a temporary setup by the user, initialization by the user, and a setup by the regenerative apparatus.

[0291]

[Table 2]

＊＊ 符号化方式、再生形態の全ての組み合わせに対する優先順位

	LPCM	符号化方式A	符号化方式B
2ch再生	4	5	6
マルチチャンネル再生	1	3	2

In addition, in Table 2, it means that priority is so high that the figure in a table is small.

[0292] It reproduces by choosing the optimal audio information like the flow chart shown in drawing 21 according to this priority setup. According to the flow chart shown in drawing 21 , the optimal audio information is chosen hereafter, and an example of the reproduced processing is explained.

[0293] First, if selection processing is started (step S10), ATS_PGCI_SRP273 will be acquired (step S11) and the playback gestalt described to be the coding method described by the item 285 of Audio coding mode in ATS_PGCI_SRP273 by the item 284 of Audio channels will be read according to a block type (step S12). Next, it judges whether there is any capacity for a regenerative apparatus to perform playback by the combination of the read coding method and a playback gestalt (step S13). consequently -- the case where there is no capacity to perform playback by the combination of the read coding method and a playback gestalt in a regenerative apparatus -- (step S13; No) -- the processing from reading of ATS_PGCI_SRP273 is repeated again (step S11-). When there is capacity for a regenerative apparatus to, perform playback by the combination of the read coding method and a regenerative apparatus on the other hand, it judges whether priority is set as choosing as a temporary setup by the user to the combination of (step S13; Yes), the read coding method, and a regenerative apparatus (step S14). When the priority concerned is set up, priority is set as choosing as a temporary setup by the user as the priority number to the combination of (step S14; Yes), the read coding method, and a regenerative apparatus (step S15). And it judges whether it is the smallest within a block (step S19), this set-up priority number ends (step S19; Yes) and selection processing, in being the smallest, it chooses PGC300 which ATS_PGCI_SRP273 concerned shows, and starts playback (step S20).

[0294] However, in not being a number within a block with the set-up smallest priority number, it repeats (step S19; No) and the processing from acquisition of next ATS_PGCI_SRP273 of the block concerned (step S11-). And about the following coding method and the combination of a playback gestalt, as mentioned above, the judgment of whether the ability to regenerate is in a regenerative apparatus and the judgment of whether priority is set up as a temporary setup by the user are performed, and processing according to a judgment result is performed (step S 13, 14, 15).

[0295] On the other hand, when priority is not set up as a temporary setup by the user about the

following coding method and the combination of a playback gestalt, it judges whether priority is set up as initial setting by the user about (step S14; No) and the combination concerned (step S16). When the priority concerned is set up, the priority as initial setting by the user is set up as the priority number to the combination of (step S16; Yes), the read coding method, and a regenerative apparatus (step S17). And it judges whether it is the smallest within a block (step S19), this set-up priority number ends (step S19; Yes) and selection processing, in being the smallest, it chooses PGC300 which ATS_PGCI_SRP273 concerned shows, and starts playback (step S20).

[0296] However, in not being a number within a block with the set-up smallest priority number, it repeats (step S19; No) and the processing from acquisition of next ATS_PGCI_SRP273 of the block concerned (step S11-). And about the following coding method and the combination of a playback gestalt, as mentioned above, the judgment of whether the ability to regenerate is in a regenerative apparatus, the judgment of whether priority is set up as a temporary setup by the user, and the judgment of whether the priority as initial setting by the user is set up are performed, and processing according to a judgment result is performed (step S 13, 14, 15, 16, 17).

[0297] On the other hand, when priority is not set up as initial setting by the user about the following coding method and the combination of a playback gestalt, the priority of initial setting from the beginning of a regenerative apparatus is set up as the priority number about (step S16; No) and the combination concerned (step S18). And it judges whether it is the smallest within a block (step S19), this set-up priority number ends (step S19; Yes) and selection processing, in being the smallest, it chooses PGC300 which ATS_PGCI_SRP273 concerned shows, and starts playback (step S20).

[0298] As mentioned above, when priority is set up to the combination of a coding method and a playback gestalt, selection of PGC300 based on the combination concerned and playback by the combination concerned are performed as a setting mode of the smallest number in the set-up priority.

[0299] As explained above, the combination of each coding method and each playback gestalt is received. If needed, it is possible to decide priority by a temporary setup by the user, initialization by the user, and each setup of setting ** by the regenerative apparatus, and it is making. By Lycium chinense Without a user choosing the class one by one, even when two or more audio information that classes differ is recorded, the optimal audio information can be chosen and it can reproduce.

[0300] In addition, in the example explained using drawing 20 and drawing 21 , when assignment of neither of the setup as which the ability to regenerate by the regenerative apparatus is not suited, either, and it is chosen is performed, the display means of display 99 grade may constitute so that an alarm display may be performed.

[Translation done.]

* NOTICES *

JPO and NCIPI are not responsible for any
damages caused by the use of this translation.

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is drawing showing the physical structure (physical format) of Video DVD.
[Drawing 2] It is drawing showing the logical configuration (logical format) of Video DVD.
[Drawing 3] It is drawing showing the physical structure (physical format) of Audio DVD.
[Drawing 4] It is drawing showing the logical configuration (logical format) of Audio DVD.
[Drawing 5] It is drawing showing the class of DVD.
[Drawing 6] It is drawing showing an example both for [DVD] an audio video.
[Drawing 7] It is drawing showing the concept of double management of the same object.
[Drawing 8] It is drawing showing the example of the navigation information as which the audio video two ways DVD shown in drawing 6 were specified.
[Drawing 9] It is drawing showing the information recorded on ATS.
[Drawing 10] It is drawing showing the relation between recognition of the user at the time of audio title playback, navigation information, and stereo information.
[Drawing 11] It is drawing showing the relation between recognition of the user at the time of the title playback both for image voice, navigation information, and stereo information.
[Drawing 12] It is drawing showing the information recorded on ATSI of the DVD disk recorded in the audio format.
[Drawing 13] It is drawing showing the information recorded on ATSI of the DVD disk recorded in the audio format and the video format.
[Drawing 14] It is drawing showing the outline configuration of a video DVD player.
[Drawing 15] It is drawing showing the outline configuration of an audio DVD player.
[Drawing 16] It is drawing showing the configuration of the audio decoder in the audio DVD player of drawing 15 .
[Drawing 17] Drawing showing the sound field formed when (A) reproduces the usual music information by which stereophonic reproduction was carried out by headphone, and (B) are drawings showing the sound field formed when the music information by which binaural playback was carried out is reproduced by headphone.
[Drawing 18] It is the conceptual diagram showing that the audio pack recorded two channels by the stereo system and the audio pack recorded two channels by the binaural method are multiplexed.
[Drawing 19] It is drawing showing an example of the circuitry of a headset jack.
[Drawing 20] It is the flow chart which shows an example of the processing which chooses PGC from the information which shows a coding method.
[Drawing 21] It is the flow chart which shows an example of the processing which chooses PGC from the information which combined the coding method and the playback gestalt.
[Description of Notations]
3 -- VMG
10 -- VOB
11 -- VTSI

202 -- AMG
204 -- SAPPT
210 -- AOB
211 -- ATSI
240 -- AMGI
242 -- ATT search pointer table
243 -- AOTT search pointer table
245 -- ATT search pointer
247 -- AOTT search pointer
251 -- TT search pointer table
254 -- TT search pointer
261 -- Title
300 -- PGC
301 -- Program

[Translation done.]

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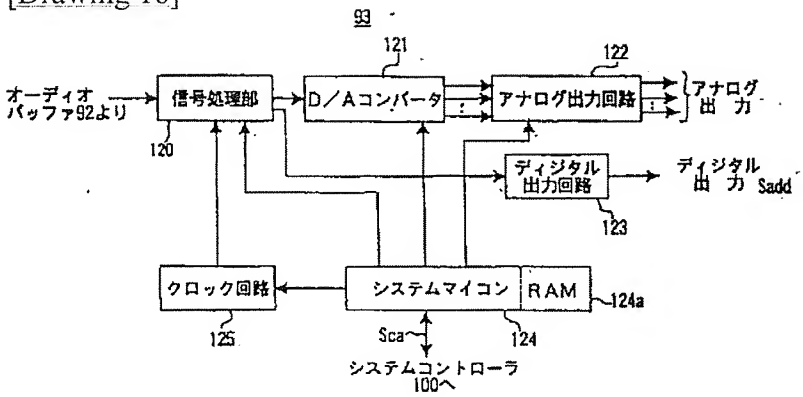
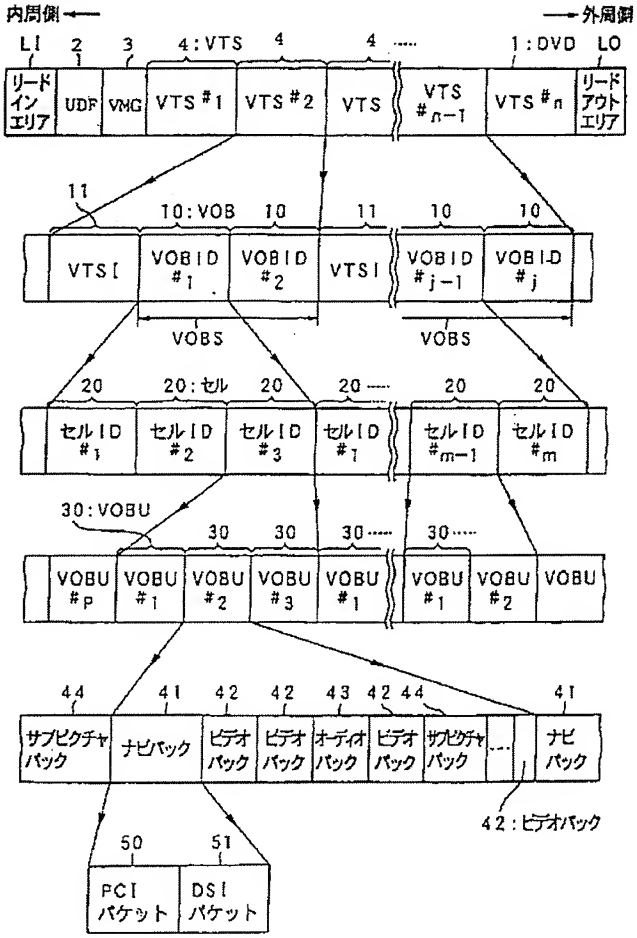
3.In the drawings, any words are not translated.

DRAWINGS

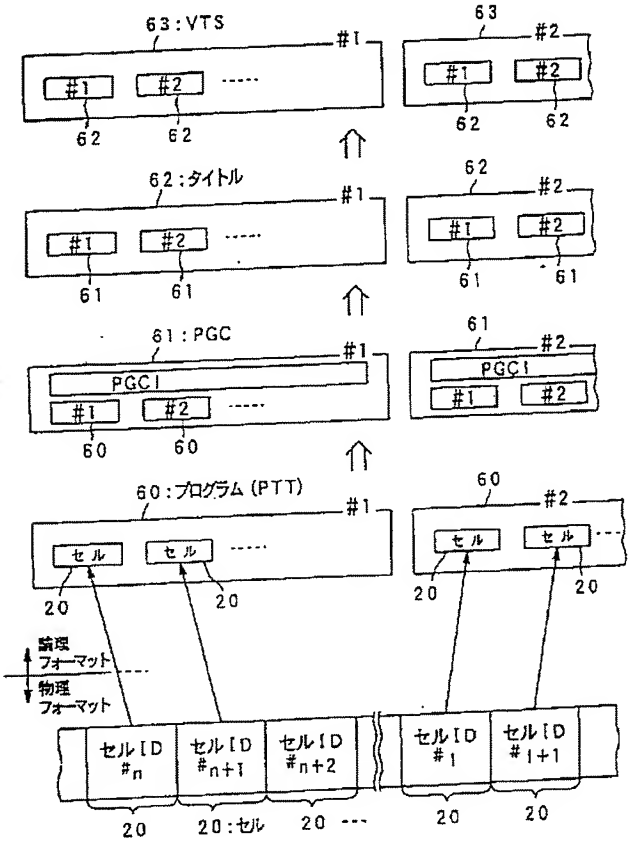
[Drawing 16]



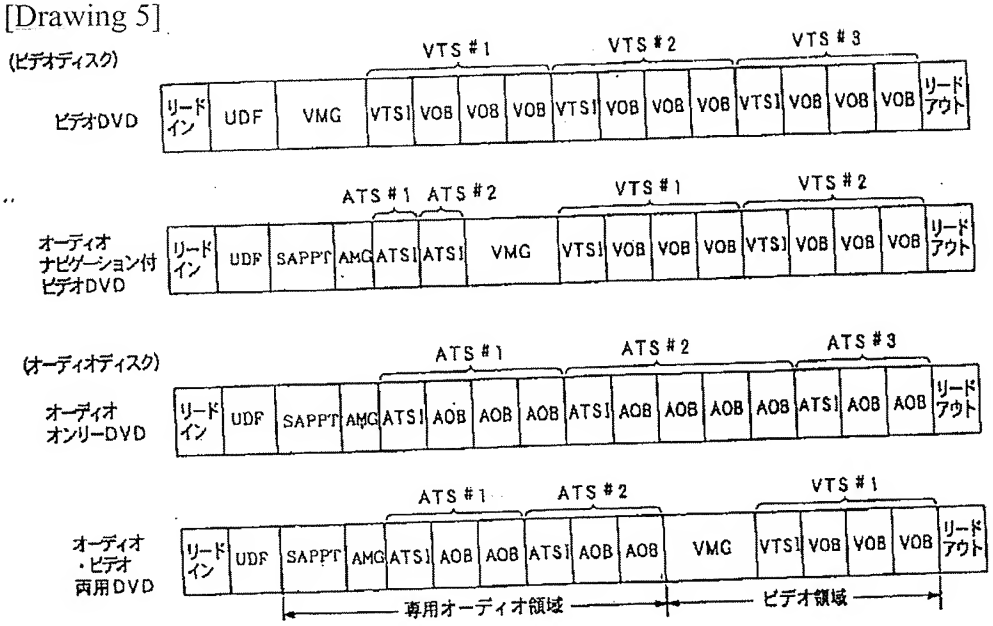
[Drawing 1]


内周側
外周側
LI
2
3
4:VTS
4
4
1:DVD
LO
リードインエリア
UDF
VMG
VTS #1
VTS #2
VTS
VTS #n-1
VTS #n
リードアウトエリア
11
10:VOB
10
11
10
10
VTSI
VOBID #1
VOBID #2
VTSI
VOBID #j-1
VOBID #j
VOBS
VOBS
20
20:セル
20
20
20
20
セルID #1
セルID #2
セルID #3
セルID #1
セルID #m-1
セルID #m
30:VOBU
30
30
30
30
VOBU #P
VOBU #1
VOBU #2
VOBU #3
VOBU #1
VOBU #1
VOBU #2
VOBU
44
41
42
42
43
42
44
41
サブピクチャパック
ナビパック
ビデオパック
ビデオパック
オーディオパック
ビデオパック
サブピクチャパック
ナビパック
42:ビデオパック
50
51
PCIパケット
DSIパケット

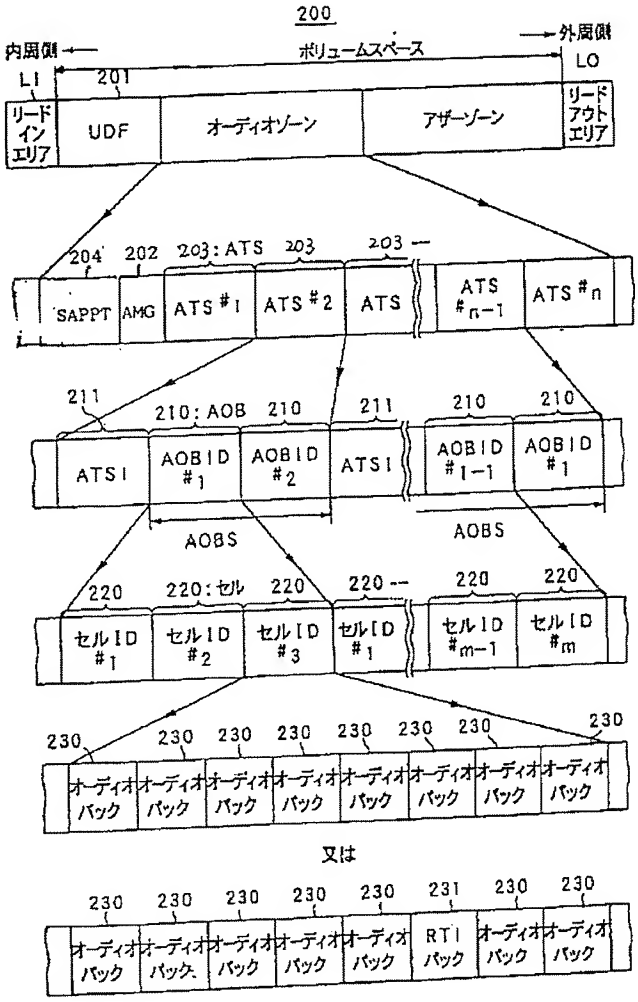
[Drawing 2]



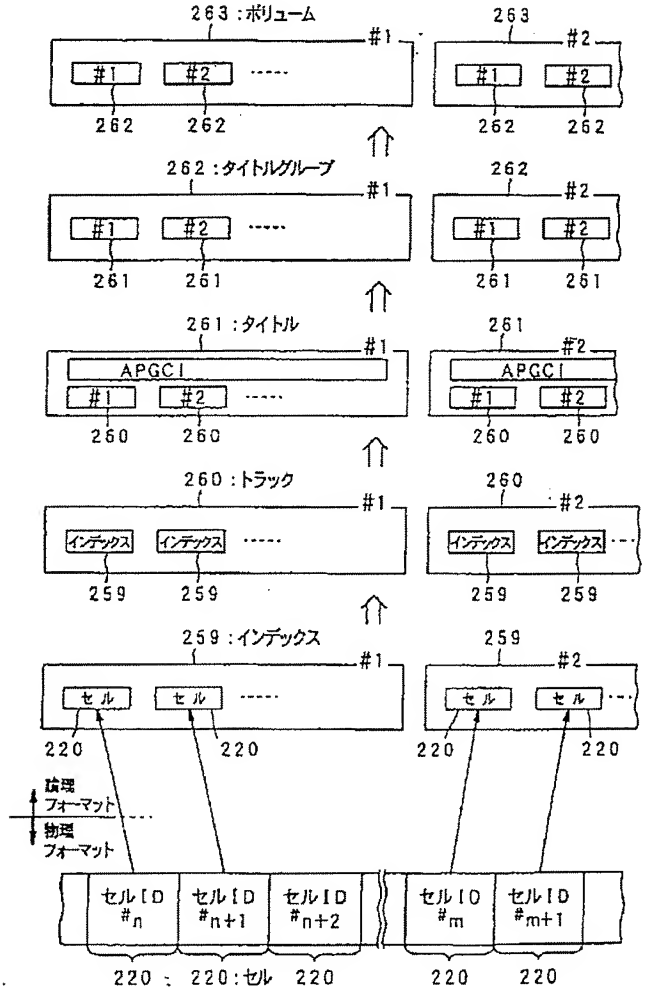
[Drawing 5]



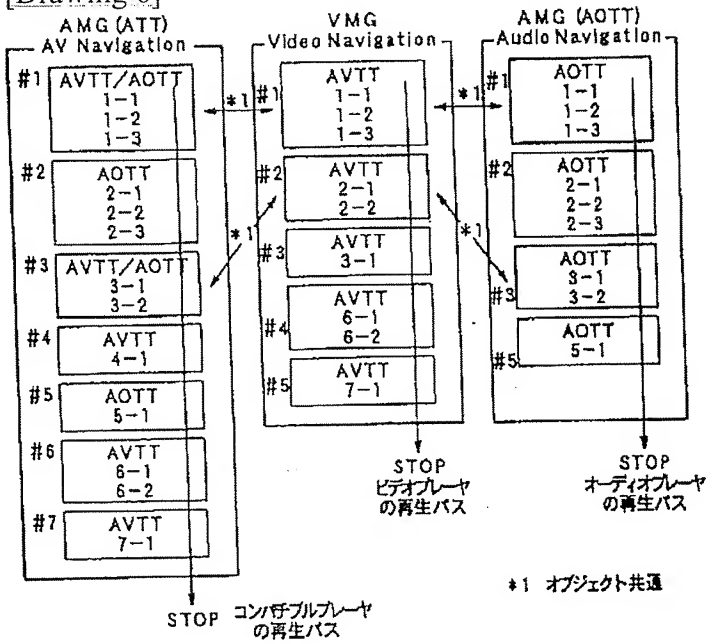
[Drawing 3]


200
内周側
ボリュームスペース
外周側
LI
LO
201
リードインエリア
UDF
オーディオゾーン
アザーゾーン
リードアウトエリア
204
202
203: ATS
203
203
SAPPT
AMG
ATS #1
ATS #2
ATS
ATS #n-1
ATS #n
211
210: AOB
210
211
210
210
ATSI
AOBID #1
AOBID #2
ATSI
AOBID #1-1
AOBID #1
AOBS
AOBS
220
220: セル
220
220
220
220
セルID #1
セルID #2
セルID #3
セルID #1
セルID #m-1
セルID #m
230
オーディオパック
又は
231
RTI パック

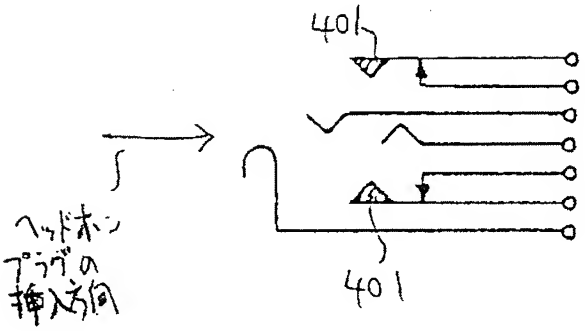
[Drawing 4]



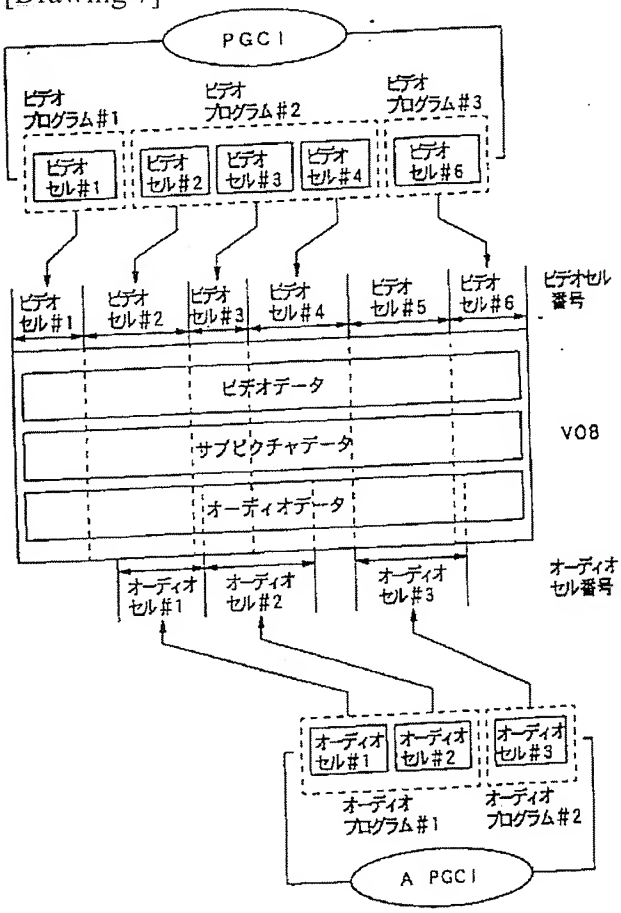
[Drawing 6]



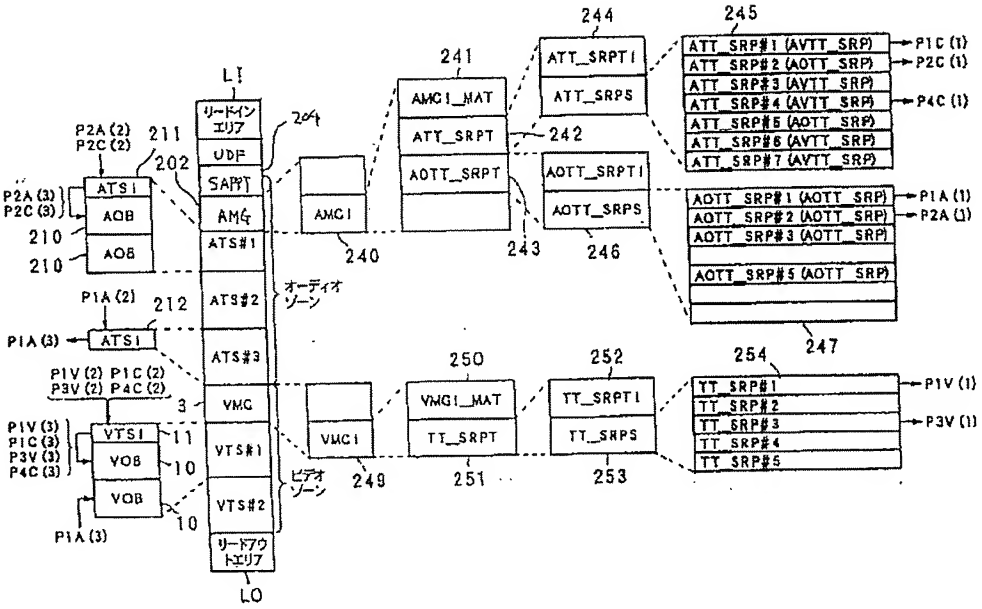
[Drawing 19]



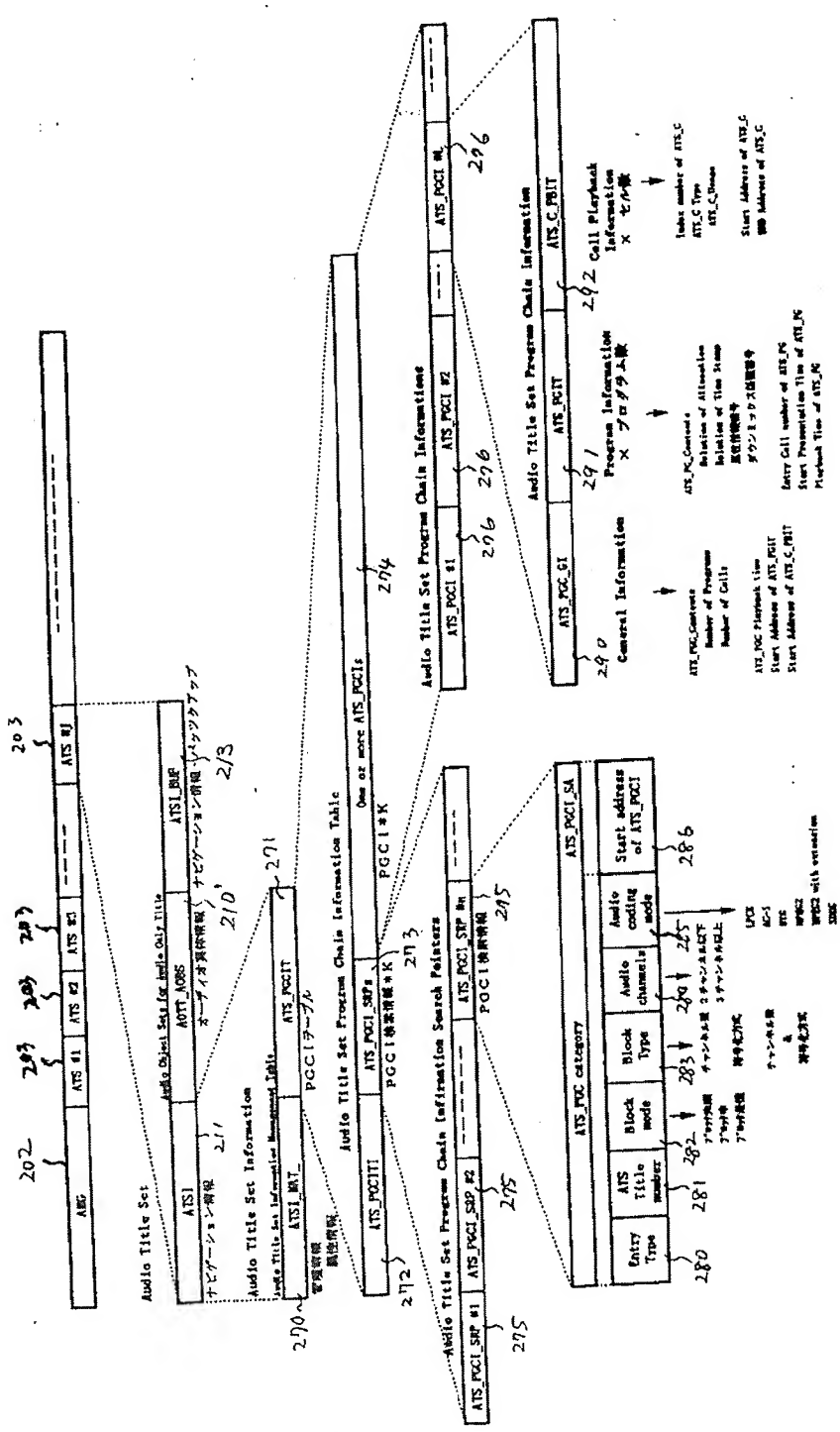
[Drawing 7]



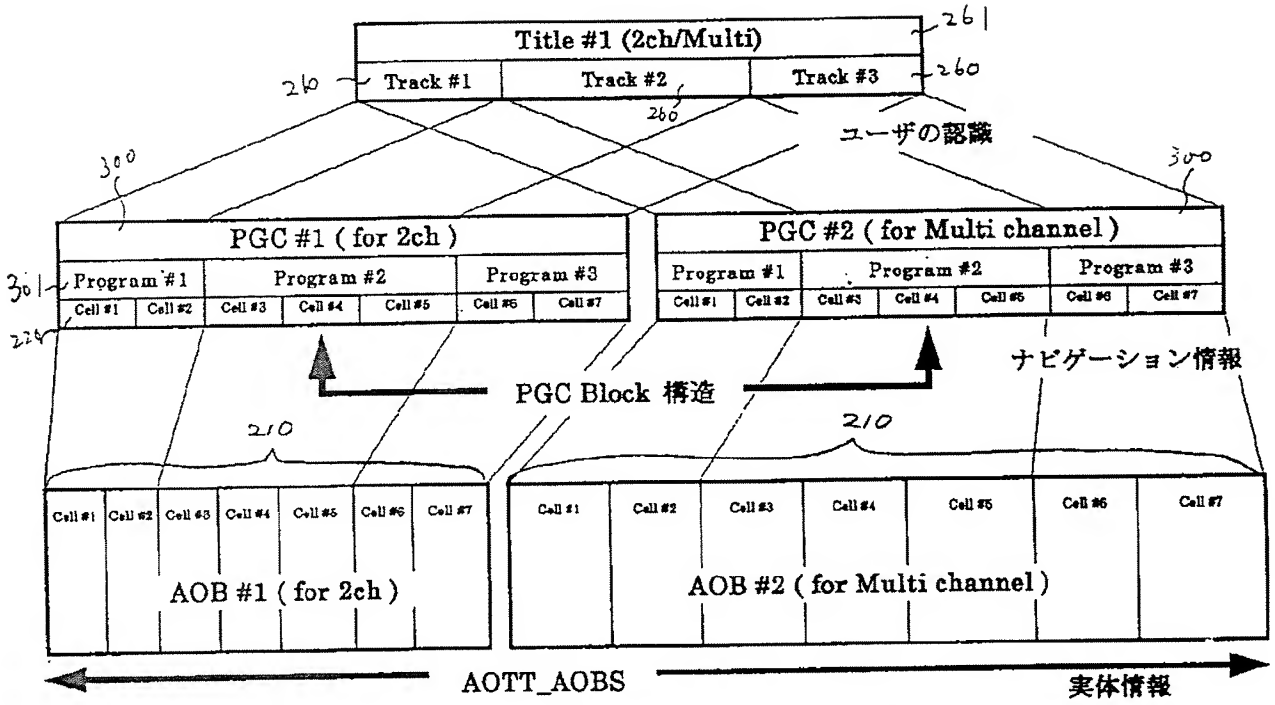
[Drawing 8]


LI
リードインエリア
UDF
SAPT
AMG
ATS#1
ATS#2
ATS#3
VMG
VTS#1
VTS#2
リードアウトエリア
LO
ATS I
AOB
AOB
ATS I
VTS I
VOB
VOB
P2A (2) P2C (2)
P2A (3) P2C (3)
P1A (2)
P1A (3)
P1V (2) P1C (2) P3V (2) P4C (2)
P1V (3) P1C (3) P3V (3) P4C (3)
P1A (3)
211
202
212
3
11
10
10
210
210
204
AMG I
240
オーディオゾーン
ビデオゾーン
VMG I
249
241
AMG I_MAT
ATT_SRPT
AOTT_SRPT
242
243
250
VMG I_MAT
TT_SRPT
251
244
ATT_SRPT I
ATT_SRPS
AOTT_SRPT I
AOTT_SRPS
246
252
TT_SRPT I
TT_SRPS
253
245
ATT_SRP#1 (AVTT_SRP)
ATT_SRP#2 (AOTT_SRP)
ATT_SRP#3 (AVTT_SRP)
ATT_SRP#4 (AVTT_SRP)
ATT_SRP#5 (AOTT_SRP)
ATT_SRP#6 (AVTT_SRP)
ATT_SRP#7 (AVTT_SRP)
P1C (1)
P2C (1)
P4C (1)
AOTT_SRP#1 (AOTT_SRP)
AOTT_SRP#2 (AOTT_SRP)
AOTT_SRP#3 (AOTT_SRP)
AOTT_SRP#5 (AOTT_SRP)
P1A (1)
P2A (1)
247
254
TT_SRP#1
TT_SRP#2
TT_SRP#3
TT_SRP#4
TT_SRP#5
P1V (1)
P3V (1)

[Drawing 9]

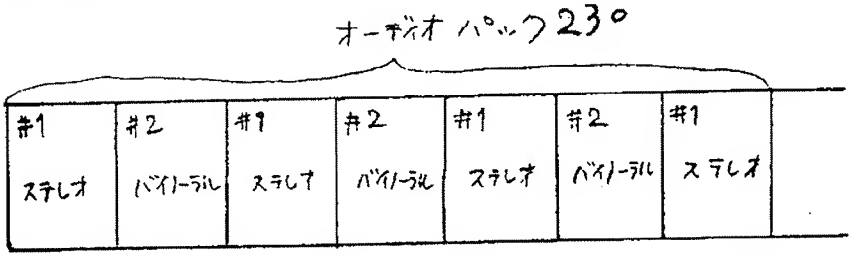


[Drawing 10]

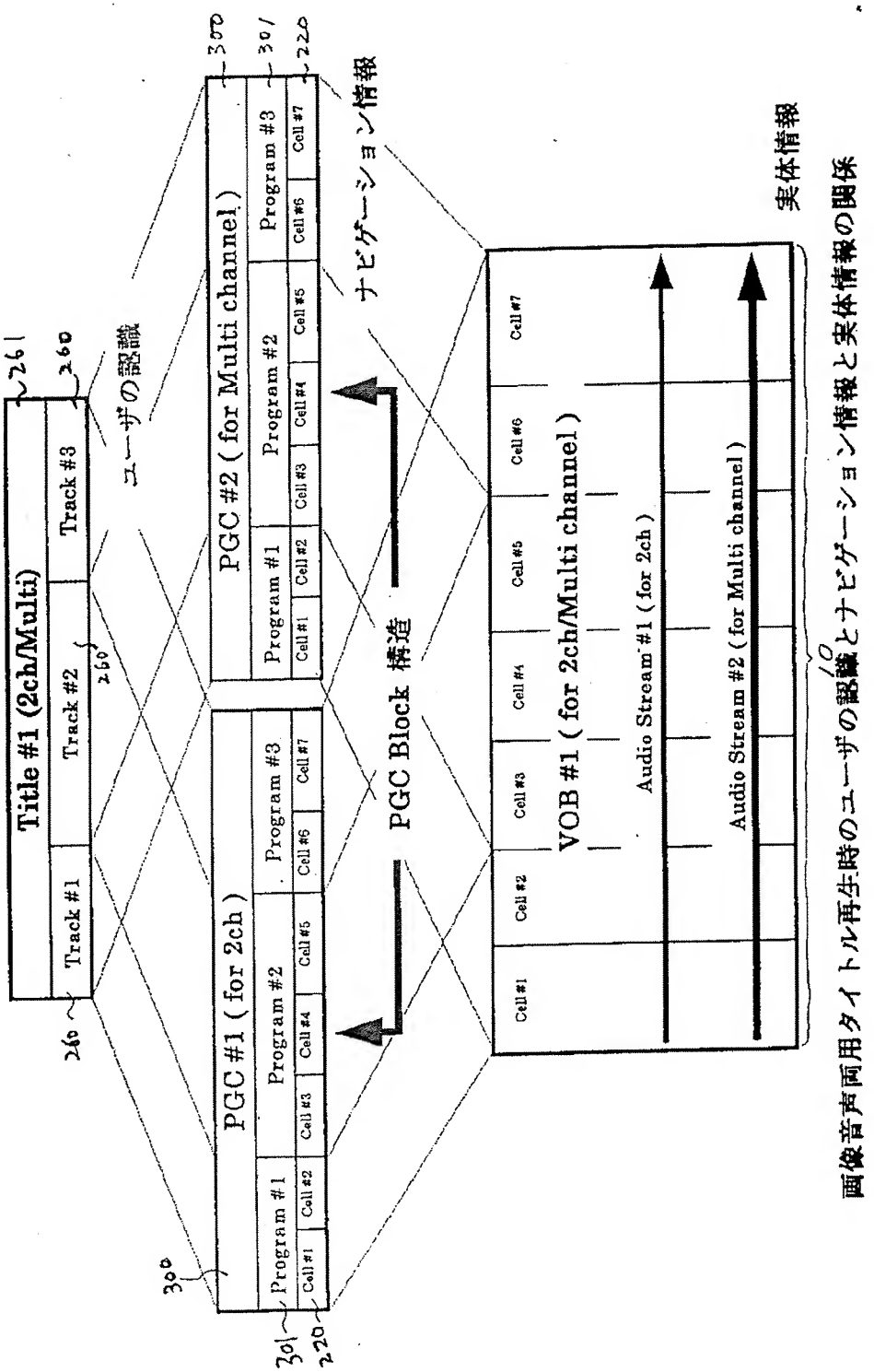


オーディオタイトル再生時のユーザの認識とナビゲーション情報と実体情報の関係

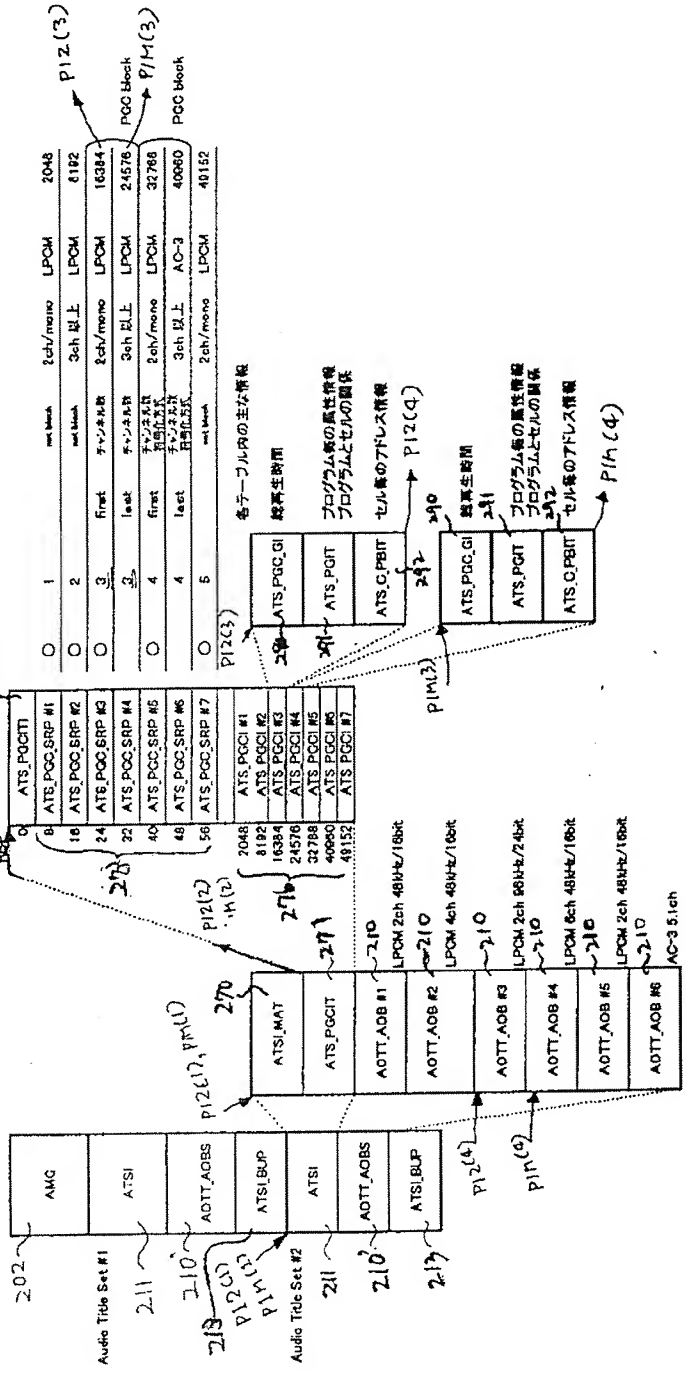
[Drawing 18]



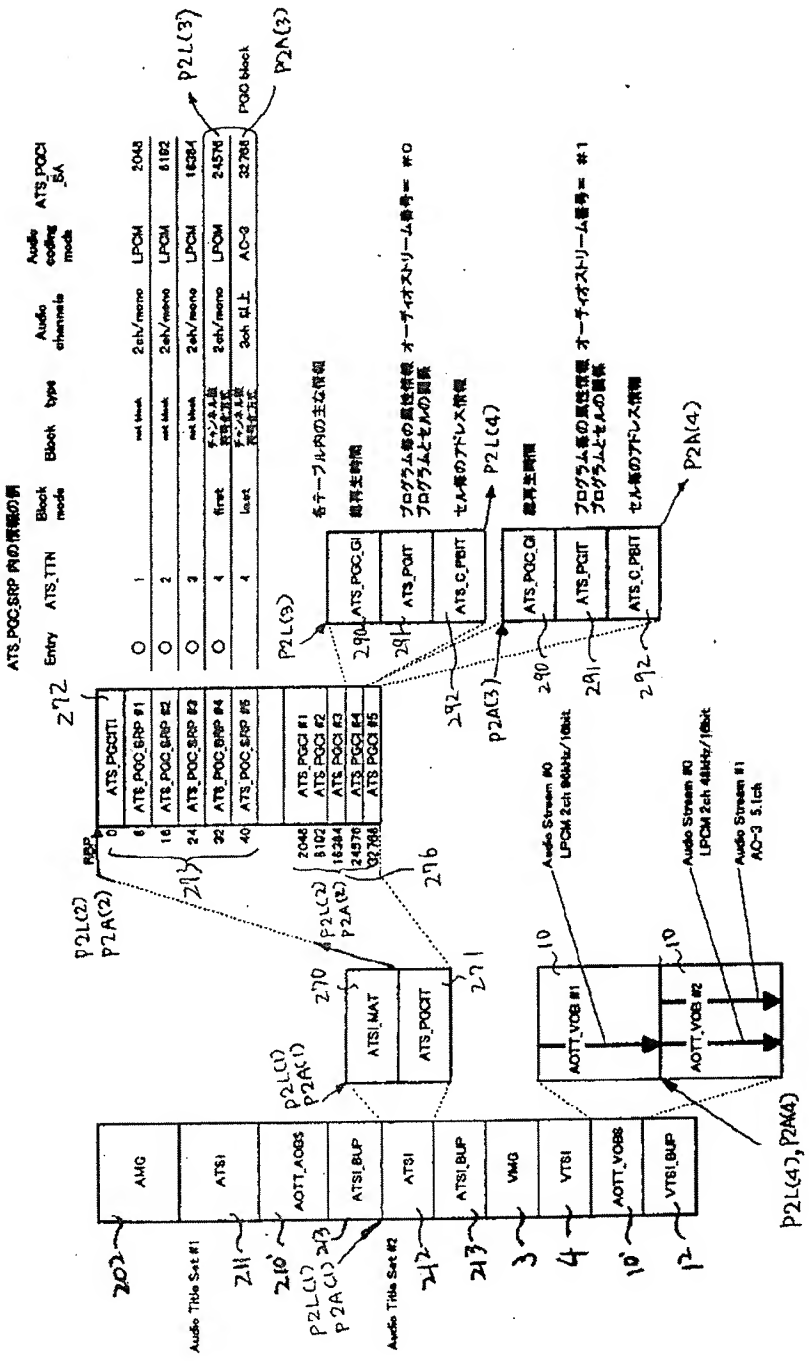
[Drawing 11]


Title #1 (2ch/Multi)
Track #1
Track #2
Track #3
ユーザの認識
ナビゲーション情報
PGC #1 (for 2ch)
PGC #2 (for Multi channel)
Program #1
Program #2
Program #3
Cell #1
Cell #2
Cell #3
Cell #4
Cell #5
Cell #6
Cell #7
PGC Block 構造
VOB #1 (for 2ch/Multi channel)
Audio Stream #1 (for 2ch)
Audio Stream #2 (for Multi channel)
実体情報
画像音声両用タイトル再生時のユーザの認識とナビゲーション情報と実体情報の関係

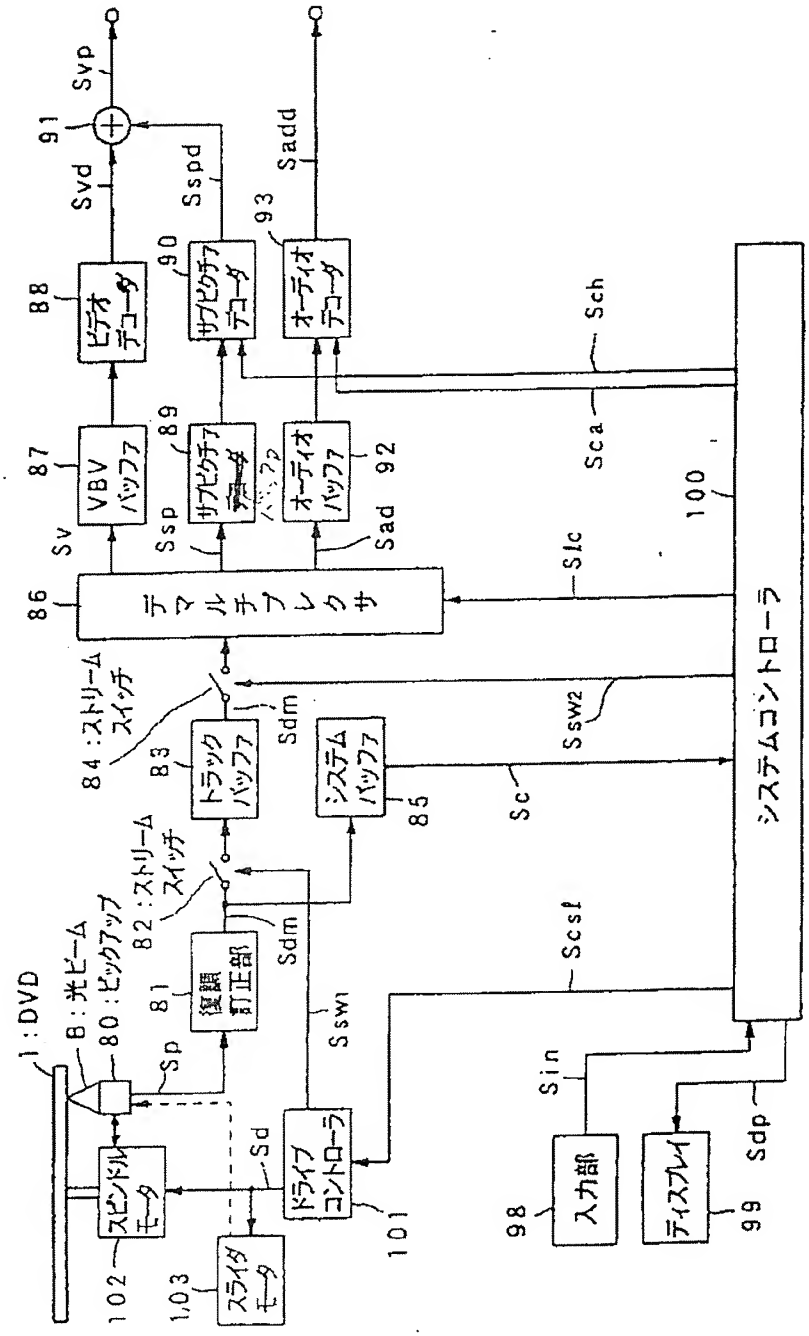
[Drawing 12]



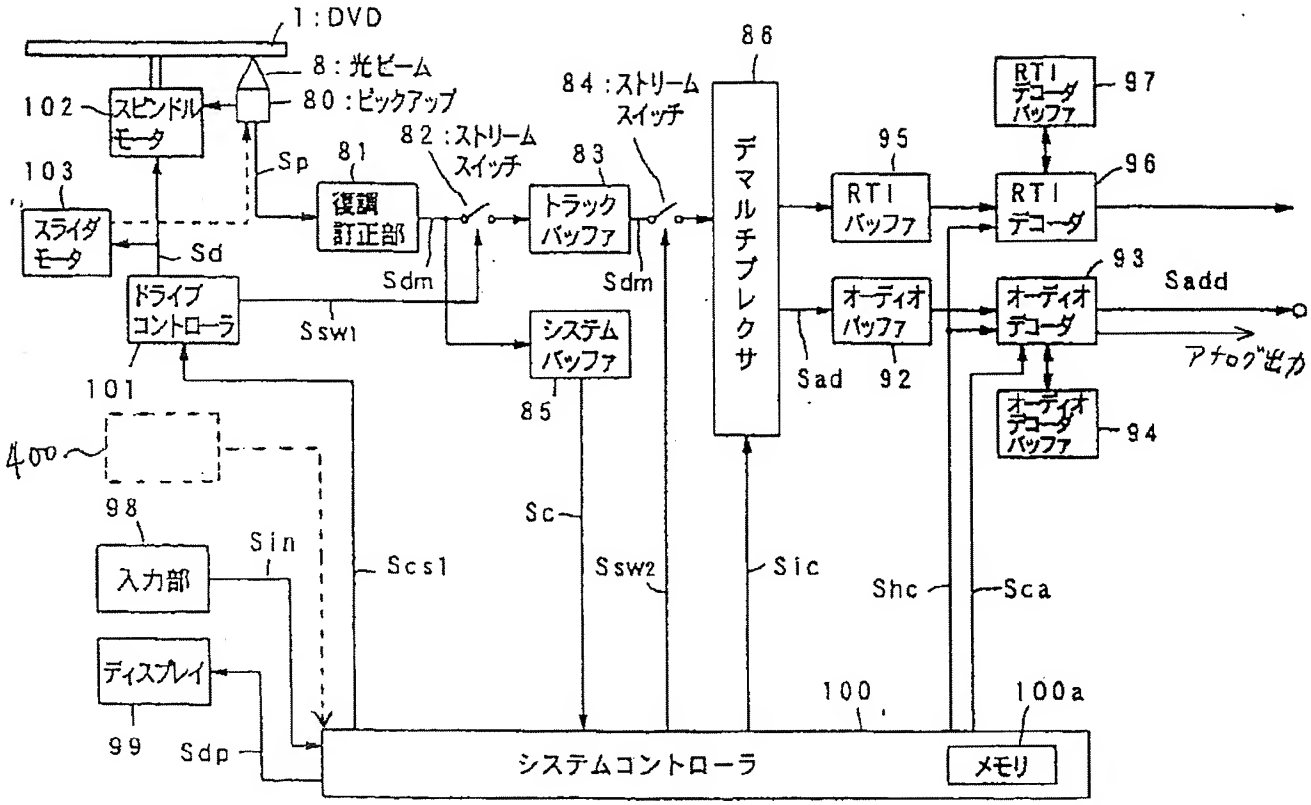
[Drawing 13]



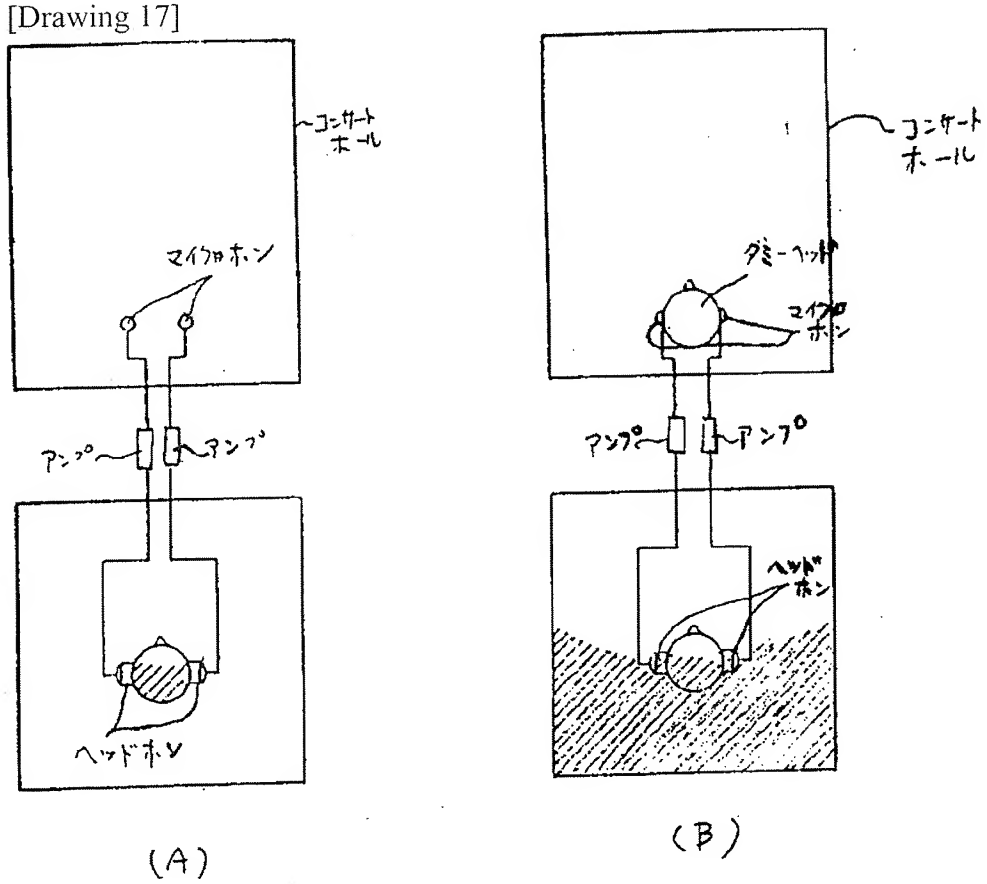
[Drawing 14]


1 : DVD
8 : 光ピックアップ
80
81 復調訂正部
82 : ストリームスイッチ
83 トラックバッファ
84 : ストリームスイッチ
85 システムバッファ
86 デマルチプレクサ
87 VBVバッファ
88 ビデオデコーダ
89 サブピクチャデコーダ
90
91
92 オーディオバッファ
93 オーディオデコーダ
98 入力部
99 ディスプレイ
100 システムコントローラ
101 ドライブコントローラ
102 スピンドルモータ
103 スライダモータ
Sv
Svd
Svp
Ssp
Sspd
Sad
Sadd
Sdm
Sd
Sp
Sswi
Ssw2
Sc
Sca
Sch
Sic
Scsl
Sin
Sdp

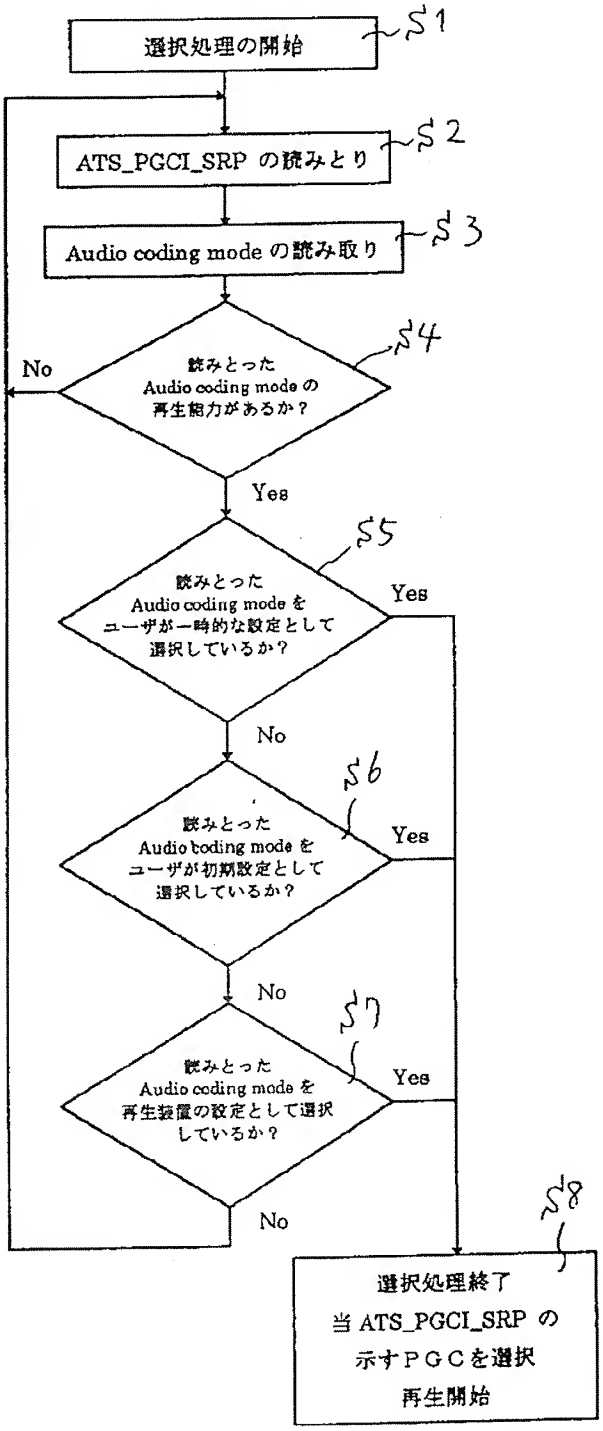
[Drawing 15]



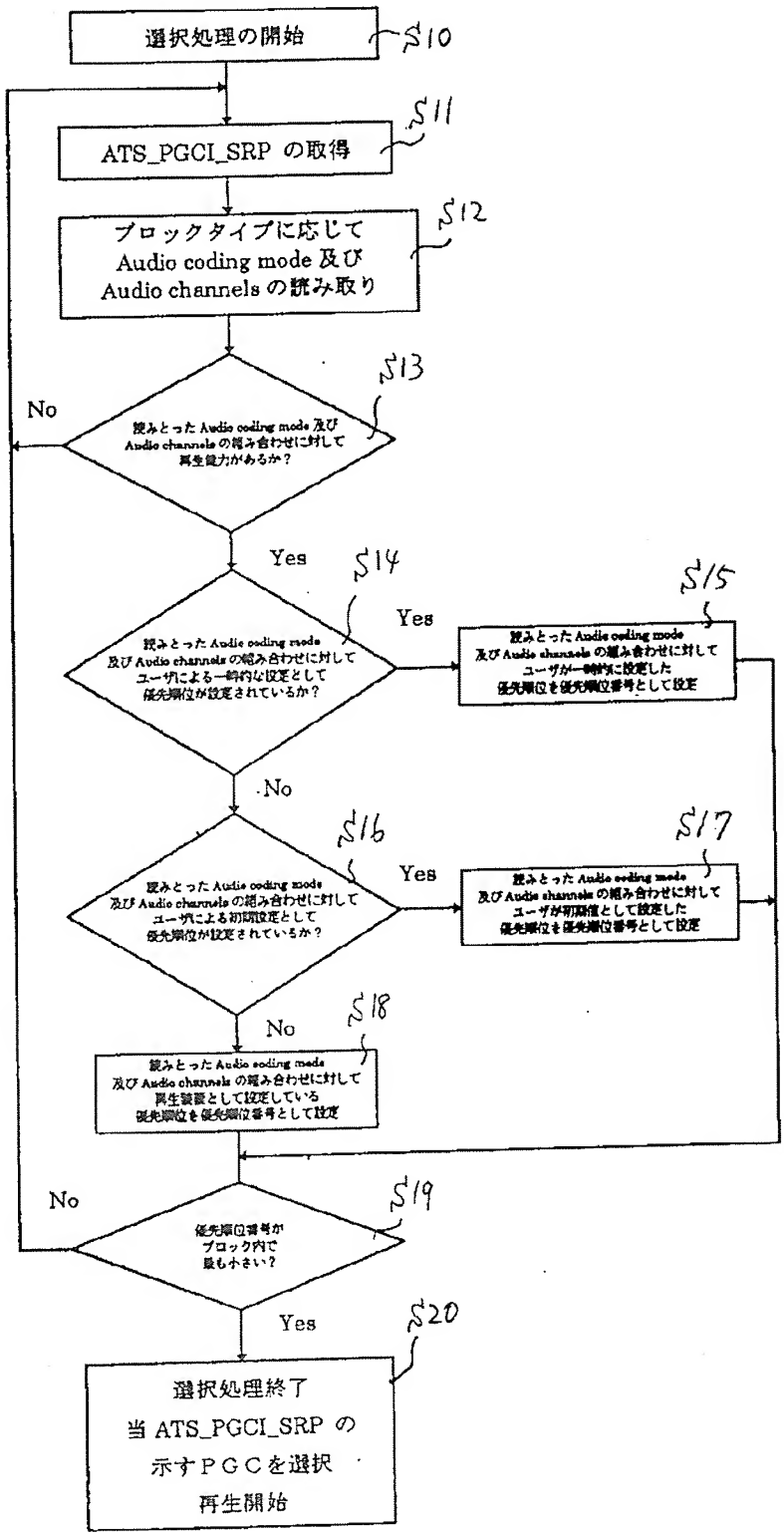
[Drawing 17]



[Drawing 20]


選択処理の開始
S1
ATS_PGCI_SRP の読みとり
S2
Audio coding mode の読み取り
S3
読みとった Audio coding mode の再生能力があるか？
S4
No
Yes
読みとった Audio coding mode をユーザが一時的な設定として選択しているか？
S5
Yes
No
読みとった Audio coding mode をユーザが初期設定として選択しているか？
S6
Yes
No
読みとった Audio coding mode を再生装置の設定として選択しているか？
S7
Yes
No
S8
選択処理終了
当 ATS_PGCI_SRP の示すＰＧＣを選択
再生開始

[Drawing 21]



[Translation done.]

* NOTICES *

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1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CORRECTION OR AMENDMENT

[Kind of official gazette] Printing of amendment by the convention of 2 of Article 17 of Patent Law
[Section partition] The 4th partition of the 6th section
[Publication date] April 13, Heisei 13 (2001. 4.13)

[Publication No.] JP,11-296997,A
[Date of Publication] October 29, Heisei 11 (1999. 10.29)
[Annual volume number] Open patent official report 11-2970
[Application number] Japanese Patent Application No. 10-116149
[The 7th edition of International Patent Classification]

G11B 20/12
27/00
27/10

[FI]

G11B 20/12
27/00 D
27/10 A

[Procedure revision]
[Filing Date] March 8, Heisei 12 (2000. 3.8)
[Procedure amendment 1]
[Document to be Amended] Specification
[Item(s) to be Amended] 0060
[Method of Amendment] Modification
[Proposed Amendment]
[0060] (1.2) Logical format
Next, the logical format (logical structure) which combined the information recorded by the physical partition shown in drawing 1 is explained using drawing 2. In addition, the playback control information (access information or hour entry) for reproducing the logical structure shown in drawing 2 combining each data (especially cel 20) shown in drawing 1 by the logical structure which information is not actually recorded on DVD1 with the structure, and is shown in drawing 2 is the things on DVD1 currently recorded especially in VTSI11.
[Procedure amendment 2]
[Document to be Amended] Specification
[Item(s) to be Amended] 0190
[Method of Amendment] Modification
[Proposed Amendment]

[0190] (5.1.2.2)ATS_PGCI
ATS_PGCI276 as playback control information corresponding to each title constitutes the list and the table following the table of a search pointer.

[Translation done.]

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特開平11－296997

(43)公開日　平成11年(1999)10月29日

(51)Int.Cl.[6]	識別記号	ＦＩ		
Ｇ１１Ｂ　20/12		Ｇ１１Ｂ　20/12		
27/00		27/00		Ｄ
27/10		27/10		Ａ

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(22)出願日　平成10年(1998)４月10日

(71)出願人　000005016
パイオニア株式会社
東京都目黒区目黒１丁目４番１号

(72)発明者　澤辺　孝夫
東京都目黒区目黒１丁目４番１号　パイオニア株式会社本社内

(72)発明者　山本　薫
埼玉県鶴ケ島市富士見６丁目１番１号　パイオニア株式会社総合研究所内

(72)発明者　石井　英宏
埼玉県所沢市花園４丁目2610番地　パイオニア株式会社所沢工場内

(74)代理人　弁理士　石川　泰男

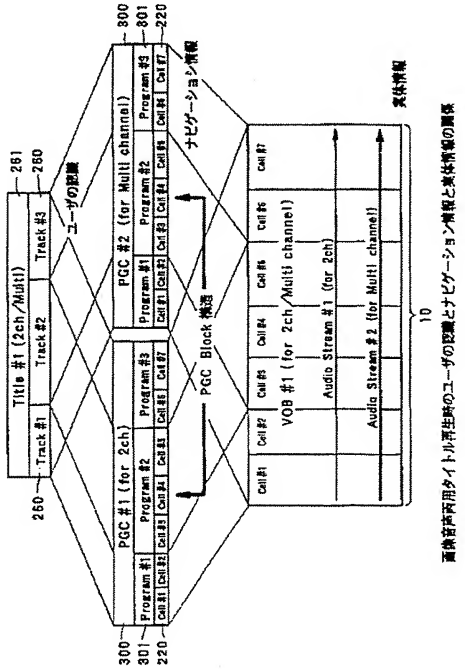
最終頁に続く

(54)【発明の名称】　情報記録媒体及び再生装置

(57)【要約】　（修正有）

【課題】　録音再生形態、又は符号化方式等が異なる複数のオーディオ情報をディスクに記録時でもユーザに対し混乱を与えず、夫々のオーディオ情報を適切に再生可能な情報記録媒体及び当該情報記録媒体により夫々のオーディオ情報を適切に再生可能な再生装置を提供する。

【解決手段】　２チャンネル再生のオーディオ情報を、オーディオストリーム＃１に記録し、マルチチャンネル再生のオーディオ情報を、オーディオストリーム＃２に記録し、該オーディオストリームを、オーディオ実体情報ＶＯＢ＃１を構成する各セル内で多重化する。該オーディオ実体情報を構成する各セルを、１曲等のトラック２６０の単位を有するプログラム＃１～＃３により区分し、２つのＰＧＣ＃１及びＰＧＣ＃２により、夫々プログラム＃１～＃３を管理する。ＰＧＣ＃１はオーディオストリーム＃１を再生する情報を持ち、ＰＧＣ＃２ではオーディオストリーム＃２を再生する情報を持つ。



1

【特許請求の範囲】

【請求項１】　記録方式が異なる複数の音情報が記録された音情報記録領域と、該音情報記録領域に記録された音情報の再生に必要な制御情報が記録された制御情報記録領域とを有する情報記録媒体であって、

前記制御情報記録領域に記録された制御情報には、前記音情報が、前記記録方式の異なる同一内容の音情報であることを示す識別情報が含まれる、ことを特徴とする情報記録媒体。

【請求項２】　前記制御情報には、前記音情報記録領域に記録された複数の音情報を第１区分単位ごとに区分するために、夫々の第１区分単位を識別する第１区分情報が更に含まれ、

前記識別情報として、区分する音情報が同一の第１区分単位に属することを示す第１区分情報が、前記記録方式の異なる同一内容の音情報ごとに設けられる、

ことを特徴とする請求項１に記載の情報記録媒体。

【請求項３】　前記制御情報には、前記音情報記録領域に記録された複数の音情報を一つの再生単位としての第２区分単位ごとに区分するために、夫々の第２区分単位を識別する第２区分情報と、

前記第１区分情報により前記第１区分単位ごとに区分される音情報を、一又は複数の第２区分単位の音情報で構成するように、前記第２区分情報と前記第１区分情報とを関係付ける管理情報とが更に含まれ、

前記記録方式の異なる同一内容の音情報が属する同一の第１区分単位を識別する第１区分情報に対しては、前記記録方式の異なる同一内容の音情報が属する同一の第２区分単位を識別する第２区分情報を、前記記録方式の異なる同一内容の音情報ごとに夫々関係付けるように、当該音情報ごとの複数の管理情報が設けられる、ことを特徴とする請求項２に記載の情報記録媒体。

【請求項４】　前記複数の管理情報の夫々は、前記第１区分情報に対し、前記記録方式の異なる同一内容の音情報ごとに、夫々等しい数及び順序の第２区分単位を識別する第２区分情報を夫々関係付けることを特徴とする請求項３に記載の情報記録媒体。

【請求項５】　前記第１区分情報に対し、前記記録方式の異なる同一内容の音情報ごとに夫々関係付けられる第２区分情報により、第２区分単位ごとに区分される音情報は、前記記録方式の異なる同一内容の音情報ごとに再生時間がほぼ等しい音情報として音情報記録領域に記録されていることを特徴とする請求項４に記載の情報記録媒体。

【請求項６】　前記識別情報により識別される前記記録方式の異なる同一内容の音情報は、音情報記録領域における同一の記録位置に多重されて記録されていることを特徴とする請求項１乃至請求項５の何れか一項に記載の情報記録媒体。

【請求項７】　前記制御情報には、前記記録方式の異なる同一内容の複数の音情報から、何れかの記録方式の同一内容の音情報を選択する情報として、前記記録方式を示す情報が含まれることを特徴とする請求項１乃至請求項６の何れか一項に記載の情報記録媒体。

2

【請求項８】　前記記録方式は、録音形態、再生形態又は符号化方式の何れか一つ、もしくはこれらの組み合わせであることを特徴とする請求項１乃至請求項７の何れか一項に記載の情報記録媒体。

【請求項９】　記録方式の異なる複数の音情報が記録された音情報記録領域と、該音情報記録領域に記録された音情報の再生に必要な制御情報が記録された制御情報記録領域とを有し、当該制御情報に、前記音情報が、前記記録方式の異なる同一内容の音情報であることを示す識別情報を含む情報記録媒体から、前記制御情報に応じて前記音情報を再生する再生装置であって、

情報記録媒体に記録された記録情報を読み取る読取手段と、

再生すべき条件を指定する指定情報を入力する入力手段と、

情報記録媒体に記録された制御情報を読み取る読取手段と、

前記指定情報、または記憶手段に記憶された設定情報に基づき、再生する記録方式を選択する選択手段と、

前記記録方式の異なる同一内容の複数の音情報の中から、前記選択手段により選択させた記録方式の音情報を前記制御情報に基づいて再生する再生手段と、を備えることを特徴とする再生装置。

【請求項１０】　前記制御情報から、当該情報記録媒体に記録された各音情報の前記記録方式を示す情報を抽出する抽出手段と、抽出した情報を表示する記録方式情報の表示手段とを更に備えることを特徴とする請求項９に記載の再生装置。

【請求項１１】　前記入力手段は、再生装置の動作状態に関わらず、前記指定情報の入力を受け付けるように設定され、前記選択手段、または前記再生手段は、前記入力手段により入力した前記指定情報の内容に変更があった場合には、変更された前記指定情報に基づいて、夫々の処理を行うように設定されていることを特徴とする請求項９または請求項１０に記載の再生装置。

【請求項１２】　前記記憶手段に記憶された設定情報の内容を書き換える書換手段を更に備えることを特徴とする請求項９乃至請求項１１の何れか一項に記載の再生装置。

【請求項１３】　前記指定情報又は前記設定情報に基づき、前記選択手段により選択される前記記録方式が、当該再生装置では処理できない場合には、警告表示を行う警告表示手段を更に備えることを特徴とする請求項９乃至請求項１２の何れか一項に記載の再生装置。

【請求項１４】　前記選択手段は、初期設定状態においては、前記記憶手段に記憶された初期設定情報に基づい

て記録方式の選択を行うように設定されていることを特徴とする請求項９乃至請求項１３の何れか一項に記載の再生装置。

【請求項１５】　請求項９乃至請求項１１の何れか一項に記載の再生装置に、　前記記憶手段に記憶された設定情報の内容を書き換える書換手段と、前記指定情報又は前記設定情報に基づき、前記選択手段により選択される前記記録方式が、当該再生装置では処理できない場合には、警告表示を行う警告表示手段と、初期設定状態においては、前記記憶手段に予め記憶された初期設定情報に基づいて記録方式の選択を行うように設定されている選択手段とを備え、該選択手段は、更に、前記警告表示手段による前記警告表示が行われない限り、まず前記入力手段により入力された指定情報、次に前記書換手段により書き換えられた設定情報、最後に前記初期設定情報、という優先順位で夫々の情報に基づく記録方式の選択を行うように設定されていることを特徴とする再生装置。

【請求項１６】　ヘッドフォンプラグのヘッドフォンジャックに対する挿入状態を検出する検出手段を更に備え、前記再生手段は、該検出手段によりヘッドフォンプラグがヘッドフォンジャックに挿入されたことを検出した場合には、バイノーラル録音された音情報を再生するように設定されていることを特徴とする請求項９乃至請求項１５の何れか一項に記載の再生装置。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】本発明は、録音形態又は再生形態もしくは符号化方式の異なる音楽等の音情報が記録されたＤＶＤディスク等の情報記録媒体と、この情報記録媒体から音情報を再生する再生装置の技術分野に属するものである。

【０００２】

【従来の技術】映画などの映像情報を記録する記録媒体としてビデオＤＶＤ（ＤＶＤ－Ｖｉｄｅｏ規格に準拠したディスク）が知られている。ビデオＤＶＤはその大容量性から映画などの映像情報の記録媒体として広く使用されている。

【０００３】また、映画などの映像情報ではなく、音楽などのオーディオ情報のみを記録することを念頭においたオーディオＤＶＤ（ＤＶＤ－Ａｕｄｉｏ規格に準拠したディスク）も開発されている。このオーディオＤＶＤにはＤＶＤとしての大容量性から複数のＣＤ（コンパクトディスク）に相当するオーディオ情報を１枚のオーディオＤＶＤに記録することが可能となる。また、映画などの映像情報に加えて、その映画のサウンドトラック版の音楽ＣＤに相当するようなオーディオ情報を記録することも可能である。

【０００４】

【発明が解決しようとする課題】オーディオＤＶＤは、主に音楽などのオーディオ情報を記録することを目的とし、今までにないマルチチャンネルの再生を可能にしようとしている。また、マルチチャンネルだけでなく２ｃｈステレオ再生としても、今までにない高品位な再生を可能にしようとしている。

【０００５】このようなＤＶＤオーディオディスクにおいて、マルチチャンネルのオーディオ情報しか記録されていない場合、２ｃｈ専用の再生装置を持っている人は、その一部の音しか聞くことができない、又はまったく再生できないといった問題を生じる。

【０００６】そこで、２ｃｈ専用の再生装置しか持っていない人でも、このディスクを楽しめるようにするには、マルチチャンネルのオーディオ情報と共に２ｃｈ再生用のオーディオ情報を、ディスク上に記録する必要がある。

【０００７】しかし、この場合、この２種類のオーディオ情報は、当然同じタイトル、同じ曲を録音したものである。従ってこの２種類のオーディオ情報をこのまま、ディスク上に記録したのでは、同名のタイトル、同名の曲が２種類存在することとなりユーザの混乱を招くという第１の問題がある。この第１の問題は、チャンネル等の再生形態が異なる場合だけでなく、バイノーラル録音等の録音形態が異なる場合、あるいはＡＣ－３等の符号化方式が異なる場合、更にはこれらの再生形態、録音形態、または符号化方式の組み合わせが異なる場合に同様に生じる問題であった。

【０００８】次に、既に規格化された、ＤＶＤビデオフォーマットでは、画像情報と共に複数のオーディオ情報を同時に記録することができる。例えば、ある映画に対して、オリジナルの言語の音声と日本語吹き替えの音声を切り換えることができる。また同様に同一タイトルの中でＬＰＣＭステレオ音声とＡＣ－３マルチチャンネル音声を切り換えることも可能である。従って複数のオーディオ情報を同一のタイトル、同一の曲として扱うことができ、オーディオストリームを変更することで、再生したいオーディオ情報の種類を変更することができるようになっている。

【０００９】一方、オーディオＤＶＤにも画像情報を記録したいという要求もあり、メニューや付加情報的な映像情報の記録を可能にしようとしている。この場合、ＤＶＤビデオフォーマットと異なる方法で絵を記録したのでは、ビデオフォーマットと互換を取ることができない。現在市場にあるビデオプレーヤでも、オーディオディスクの絵がついた部分の再生ができることが望ましい。

【００１０】従ってこれらの観点からも、画像を伴った場合の実体情報を記録する構造は、ＤＶＤビデオフォーマットと同じ構造にする必要がある。

【００１１】しかし、このためには、複数種類のオーディオ情報を多重し、一つのオブジェクトとしてディスク上に記録する必要がある。また複数のストリームを管理

するため、データ中にも管理情報を置くことが必要となる。従ってビデオフォーマットと同じ構造を持つことになった場合、再生装置による再生時の切り替えに必要な処理が少ない反面、記録時の処理が複雑になるという不具合を生じる。

【００１２】オーディオフォーマットには、録音用としての機能や、現在使用されているスタジオ機器との整合性を重視し、特に記録時の処理が複雑でないことが求められており、特にデータ中に管理情報を置かない構造が必要とされる。

【００１３】従って、オーディオ情報しか記録しない場合のＤＶＤオーディオフォーマット独自の構造と、画像を伴った場合のＤＶＤビデオフォーマットに準拠した構造の２種類の構造が必要となる。このように２種類の構造のデータに対して、音声情報だけを再生しようとする場合、その再生制御情報は、共通な論理構造としないと、全く違った２種類のフォーマットが存在することとなり再生装置の処理が重くなり、統一的な操作を提供できないため、ユーザの混乱を生ずるという第２の問題がある。

【００１４】本発明は、以上の点に鑑みてなされたものであり、録音形態、再生形態、又は符号化方式等が異なる複数のオーディオ情報をディスクに記録する場合であっても、ユーザに対して混乱を与えることなく、夫々のオーディオ情報を適切に再生させることのできる情報記録媒体及び当該情報記録媒体により夫々のオーディオ情報を適切に再生することのできる再生装置を提供することを第１の課題としている。

【００１５】また、オーディオ情報しか記録しない場合のＤＶＤオーディオフォーマット独自の構造と、画像を伴った場合のＤＶＤビデオフォーマットに準拠した構造の２種類の構造を有する場合でも、夫々のディスクの構造の相違を意識することなく統一的な操作で複数種類のオーディオ情報を選択する環境を提供することのできる情報記録媒体、更にその適切な再生を可能とする再生装置を提供することを第２の課題としている。

【００１６】

【課題を解決するための手段】請求項１に記載の情報記録媒体は、前記課題を解決するために、記録方式が異なる複数の音情報が記録された音情報記録領域と、該音情報記録領域に記録された音情報の再生に必要な制御情報が記録された制御情報記録領域とを有する情報記録媒体において、前記制御情報記録領域に記録された制御情報には、前記音情報が、前記記録方式の異なる同一内容の音情報であることを示す識別情報が含まれることを特徴とする。

【００１７】請求項１に記載の情報記録媒体によれば、再生装置により、制御情報記録領域に記録された制御情報が読み取られ、この制御情報に基づいて、音情報記録領域に記録された音情報の中からの所望の音情報の検索が行われ、検索した音情報についての再生が行われることになる。従って、同一内容について記録方式の異なる複数の音情報が前記音情報記録領域に記録されている場合には、夫々の音情報ごとに前記の検索が必要とされる。しかしながら、本発明においては、前記制御情報に含まれる識別情報により、前記所望の音情報がこのような音情報であることが認識されることになり、ユーザが再生装置により再生しようとする音情報を指定する段階においては、その音情報の内容に応じた指定を行うだけで、例えば再生装置の処理能力に応じた記録方式の音情報の検索と再生が行われることになる。このように、本発明によれば、記録方式の異なる同一内容の音情報を、当該内容の下に管理することができるので、ユーザに混乱を与えることがない。

【００１８】請求項２に記載の情報記録媒体は、前記課題を解決するために、請求項１に記載の情報記録媒体において、前記制御情報には、前記音情報記録領域に記録された複数の音情報を第１区分単位ごとに区分するために、夫々の第１区分単位を識別する第１区分情報が更に含まれ、前記識別情報として、区分する音情報が同一の第１区分単位に属することを示す第１区分情報が、前記記録方式の異なる同一内容の音情報ごとに設けられることを特徴とする。

【００１９】請求項２に記載の情報記録媒体によれば、再生装置により、制御情報記録領域に記録された制御情報としての第１区分情報が読み取られ、所望の音情報が属する第１区分単位の検索が行われ、検索した第１区分単位に属する音情報についての再生が行われることになる。従って、同一内容について記録方式の異なる複数の音情報が第１区分単位ごとに記録されている場合には、夫々の音情報ごとに第１区分単位の検索が必要とされる。しかしながら、本発明においては、前記識別情報として、区分する音情報が同一の第１区分単位に属することを示す第１区分情報が、前記記録方式の異なる同一内容の音情報ごとに設けられる。つまり、このような音情報は、夫々記録方式が異なるが、同一の第１区分単位に属しており、第１区分情報の内容も同一となっている。その結果、このような音情報に対する指定は、単一の第１区分情報に対応するもので良いことになる。しかも、この単一の第１区分情報は、前記記録方式の異なる同一内容の音情報ごとに設けられているので、第１区分情報の読み取りの際に、所望の音情報がこのような音情報であることが認識されることになる。そして、この認識が行われた後、当該単一の第１区分情報によって示される単一の第１区分単位に属する音情報のうち、例えば再生装置の処理能力に応じた記録方式の音情報についての再生が行われることになる。このように、本発明によれば、記録方式の異なる同一内容の音情報を、当該内容の下に管理することができるので、ユーザは前記記録方式の異なる同一内容の音情報であっても、音情報ごとに指

定する必要がなく、ユーザに混乱を与えることがない。

【００２０】請求項３に記載の情報記録媒体は、前記課題を解決するために、請求項２に記載の情報記録媒体において、前記制御情報には、前記音情報記録領域に記録された複数の音情報を一つの再生単位としての第２区分単位ごとに区分するために、夫々の第２区分単位を識別する第２区分情報と、前記第１区分情報により前記第１区分単位ごとに区分される音情報を、一又は複数の第２区分単位の音情報で構成するように、前記第２区分情報と前記第１区分情報とを関係付ける管理情報とが更に含まれ、前記記録方式の異なる同一内容の音情報が属する同一の第１区分単位を識別する第１区分情報に対しては、前記記録方式の異なる同一内容の音情報が属する同一の第２区分単位を識別する第２区分情報を、前記記録方式の異なる同一内容の音情報ごとに夫々関係付けるように、当該音情報ごとの複数の管理情報が設けられることを特徴とする。

【００２１】請求項３に記載の情報記録媒体によれば、再生装置により、制御情報記録領域に記録された制御情報としての第１区分情報が読み取られ、所望の音情報が属する第１区分単位の検索が行われる。次に、検束した第１区分単位を示す第１区分情報に対応する管理情報が読み取られ、当該第１区分情報に関係付けられた第２区分情報が読み取られる。この第２区分情報により、先に検索した第１区分単位の音情報について、更に第２区分単位の検索が行われ、音情報は一つの再生単位ごとに再生されることになる。また、ユーザにより、直接第２区分単位での指定が行われた場合には、同様の手順により指定された第２区分単位の検索が行われ、指定された第２区分単位の音情報のみが再生されることになる。

【００２２】次に、同一内容について記録方式の異なる複数の音情報が第１区分単位ごとに記録されている場合には、前記識別情報として、区分する音情報が同一の第１区分単位に属することを示す第１区分情報が、前記記録方式の異なる同一内容の音情報ごとに設けられる。更に、このような第１区分情報には、管理情報により、前記記録方式の異なる同一内容の音情報ごとに、第２区分情報が関係付けられており、この第２区分情報は、前記記録方式の異なる同一内容の音情報が属する同一の第２区分単位を与える。上述したように、第１区分情報は、前記記録方式の異なる同一内容の音情報ごとに設けられているものの、その内容は同一であり、単一の第１区分情報が与えられることになるが、第２区分情報も前記記録方式の異なる同一内容の音情報ごとに設けられており、その内容は同一であり、単一の第２区分情報が与えられる。従って、異なる記録方式の音情報を再生する場合でも、上述した第１区分単位の検索及び第２区分単位の検索処理は、夫々の記録方式の音情報について同一であり、第２区分単位の連続した再生あるいは指定した第２区分単位の再生を、単一の指定の下における単一の処理により実行することができる。このように、本発明によれば、記録方式の異なる同一内容の音情報を、当該内容の下に、かつ、一つの再生単位ごとに管理することができるので、ユーザは前記記録方式の異なる同一内容の音情報であっても、音情報ごとに指定する必要がなく、ユーザに混乱を与えることがない。

【００２３】請求項４に記載の情報記録媒体は、前記課題を解決するために、請求項３に記載の情報記録媒体において、前記複数の管理情報の夫々は、前記第１区分情報に対し、前記記録方式の異なる同一内容の音情報ごとに、夫々等しい数及び順序の第２区分単位を識別する第２区分情報を夫々関係付けることを特徴とする。

【００２４】請求項４に記載の情報記録媒体によれば、前記記録方式の異なる同一内容の音情報ごとに、第１区分情報に夫々関係付けられる第２区分情報が複数の第２区分単位示す場合であっても、第２区分単位の数及び順序は、前記複数の管理情報の夫々により、前記記録方式の異なる同一内容の音情報ごとに等しく設定されている。従って、第１区分単位を区切るｎ番目の第２区分単位の検索と再生を行うための手順は、前記記録方式の異なる同一内容の音情報ごとに同一とすることができ、処理の簡易化を図ることができる。このことは、再生装置による処理の共通化につながり、更にはユーザによる操作の共通化につながるため、ユーザに混乱を与えることをより一層確実に防止することができる。

【００２５】請求項５に記載の情報記録媒体は、前記課題を解決するために、請求項４に記載の情報記録媒体において、前記第１区分情報に対し、前記記録方式の異なる同一内容の音情報ごとに夫々関係付けられる第２区分情報により、第２区分単位ごとに区分される音情報は、前記記録方式の異なる同一内容の音情報ごとに再生時間がほぼ等しい音情報として音情報記録領域に記録されていることを特徴とする。

【００２６】請求項５に記載の情報記録媒体によれば、前記記録方式の異なる同一内容の音情報ごとに、第１区分情報に夫々関係付けられる第２区分情報が複数の第２区分単位示す場合であっても、第２区分単位ごに区分される音情報の再生時間は、前記記録方式の異なる同一内容の音情報ごとにほぼ等しくなるように記録されている。従って、夫々の記録方式に応じた再生方式により、音情報を再生する場合でも、ユーザに対して違和感を与えることがなく、ユーザに混乱を与えることをより一層確実に防止することができる。

【００２７】請求項６に記載の情報記録媒体は、前記課題を解決するために、請求項１乃至請求項５の何れか一項に記載の情報記録媒体において、前記識別情報により識別される前記記録方式の異なる同一内容の音情報は、音情報記録領域における同一の記録位置に多重されて記録されていることを特徴とする。

【００２８】請求項６に記載の情報記録媒体によれば、

前記識別情報により識別される前記記録方式の異なる同一内容の音情報は、音情報記録領域の記録単位に記録されることになるが、その記録単位は当該音情報の記録方式に拘わらず同一であり、しかも当該同一の記録位置に多重されて記録されている。従って、識別情報によって前記記録方式の異なる同一内容の音情報であることを識別した後に、制御情報に基づいて所望の音情報の記録された前記記録単位を検索し、検索した記録単位の中に多重された音情報のうちの所望の音情報のみを再生することができる。特に、請求項２乃至請求項５の何れかに係る発明においては、前記記録方式の異なる同一内容の複数の音情報に対しての前記記録単位の検索は、単一の第１区分情報により示される単一の第１区分単位に基づいて行われるが、、単一の第１区分情報は、前記記録方式の異なる同一内容の複数の音情報ごとに設けられているので、夫々の音情報を選択する情報を、第１区分情報レベルの階層に持たせることができる。従って、ＤＶＤビデオフォーマットで記録された音情報を、ＤＶＤオーディオフォーマットに対応した制御情報に基づいて再生することができる。

【００２９】請求項７に記載の情報記録媒体は、前記課題を解決するために、請求項１乃至請求項６の何れか一項に記載の情報記録媒体において、前記制御情報には、前記記録方式の異なる同一内容の複数の音情報から、何れかの記録方式の同一内容の音情報を選択する情報として、前記記録方式を示す情報が含まれることを特徴とする。

【００３０】請求項７に記載の情報記録媒体によれば、前記識別情報により、所望の音情報が前記記録方式の異なる同一内容の音情報であることが認識された場合には、前記制御情報に含まれる前記記録方式を示す情報に基づいて、前記記録方式の異なる同一内容の複数の音情報から、所望の記録方式の同一内容の音情報が容易に選択されることになる。また、この情報記録媒体を再生しようとする再生装置が、前記所望の記録方式を処理できないものである場合には、例えばユーザによる当該記録方式の指定が無効である旨の警告を容易に行うことができる。

【００３１】請求項８に記載の情報記録媒体は、前記課題を解決するために、請求項１乃至請求項７の何れか一項に記載の情報記録媒体において、前記記録方式は、録音形態、再生形態、又は符号化方式の何れか一つ、もしくはこれらの組み合わせであることを特徴とする。

【００３２】請求項８に記載の情報記録媒体によれば、録音形態、再生形態、又は符号化方式の何れか一つ、もしくはこれらの組み合わせの異なる同一内容の複数の音情報が記録されており、ユーザの要求に応じた、あるいは当該情報記録媒体を再生する再生装置の能力に応じた音情報の適切な再生が、ユーザの混乱を招くことなく行われることになる。

【００３３】請求項９に記載の再生装置は、前記課題を解決するために、記録方式の異なる複数の音情報が記録された音情報記録領域と、該音情報記録領域に記録された音情報の再生に必要な制御情報が記録された制御情報記録領域とを有し、当該制御情報に、前記音情報が、前記記録方式の異なる同一内容の音情報であることを示す識別情報を含む情報記録媒体から、前記制御情報に応じて前記音情報を再生する再生装置において、情報記録媒体に記録された記録情報を読み取る読取手段と、再生すべき条件を指定する指定情報を入力する入力手段と、前記指定情報、または記憶手段に記憶された設定情報に基づき、前記記録方式を選択する選択手段と、前記記録方式の異なる同一内容の複数の音情報の中から前記選択手段により選択させた記録方式の音情報を前記制御情報に基づいて再生する再生手段とを備えることを特徴とする。

【００３４】請求項９に記載の再生装置によれば、ユーザが入力手段により、再生すべき条件を指定すると、この指定情報が当該入力手段によって入力される。次に、読取手段によって、このように入力された指定情報に対応する制御情報が、情報記録媒体から読み取られる。また、入力された指定情報、または記憶手段に記憶された設定情報に基づいて、選択手段により、ユーザが指定した、あるいは再生装置の能力に応じて、再生する記録方式が選択される。次に、前記記録方式の異なる同一内容の複数の音情報の中から、前記選択手段により選択させた記録方式の音情報が前記制御情報に基づいて再生手段により再生されることになる。従って、ユーザが所望の音情報の内容に応じた指定を行うだけで、所定の記録方式の音情報の再生が行われることになる。このように、本発明によれば、情報記録媒体に記録された記録方式の異なる同一内容の音情報を、ユーザに混乱を与えることなく、適切に再生することができる。

【００３５】請求項１０に記載の再生装置は、前記課題を解決するために、請求項９に記載の再生装置において、前記制御情報から、当該情報記録媒体に記録された各音情報の前記記録方式を示す情報を抽出する抽出手段と、抽出した情報を表示する記録方式情報の表示手段とを更に備えることを特徴とする。

【００３６】請求項１０に記載の再生装置によれば、前記制御情報から、当該情報記録媒体に記録された各音情報の前記記録方式を示す情報が、抽出手段により抽出される。そして、抽出された情報は、記録方式情報の表示手段によって表示されることになる。従って、ユーザは、表示された記録方式情報を参照して、再生する記録方式を指定することが可能であり、ユーザの要求に応じた適切な再生が可能である。

【００３７】請求項１１に記載の再生装置は、前記課題を解決するために、請求項９又は請求項１０に記載の再生装置において、前記入力手段は、再生装置の動作状態

に関わらず、前記指定情報の入力を受け付けるように設定され、前記選択手段、または前記再生手段は、前記入力手段により入力した前記指定情報の内容に変更があった場合には、変更された前記指定情報に基づいて、夫々の処理を行うように設定されていることを特徴とする。

【００３８】請求項１１に記載の再生装置によれば、再生装置が再生動作中であっても、また、停止中であっても、ユーザによる前記音情報の指定情報の入力が、入力手段によって受け付けられる。そして、このようにして入力された前記指定情報の内容に変更があった場合には、前記選択手段、または前記再生手段により、変更された前記指定情報に基づいて、夫々の処理が行われる。従って、記録方式の変更等のユーザの要求をリアルタイムで音情報の再生に反映させることができるので、ユーザの要求に応じたより一層適切な再生が可能である。

【００３９】請求項１２に記載の再生装置は、前記課題を解決するために、請求項９乃至請求項１１の何れか一項に記載の再生装置において、前記記憶手段に記憶された設定情報の内容を書き換える書換手段を更に備えることを特徴とする。

【００４０】請求項１２に記載の再生装置によれば、ユーザが書換手段により前記設定情報の書き換えを指示すると、書換手段により、前記記憶手段に記憶された設定情報の内容が書き換えられる。従って、再生装置の使用態様等に適合した記録方式をユーザの要求に応じて予め記憶させることができるので、適切な使用環境を提供することができる。

【００４１】請求項１３に記載の再生装置は、前記課題を解決するために、請求項９乃至請求項１２の何れか一項に記載の再生装置において、前記指定情報又は前記設定情報に基づき、前記選択手段により選択される前記記録方式が、当該再生装置では処理できない場合には、警告表示を行う警告表示手段を更に備えることを特徴とする。

【００４２】請求項１３に記載の再生装置によれば、選択手段により、前記指定情報又は前記設定情報に基づいて選択される前記記録方式が、当該再生装置では処理できない場合には、警告表示手段により警告表示が行われる。従って、ユーザは、再生装置の能力に応じた適切な記録方式の指定あるいは書き換えが可能である。

【００４３】請求項１４に記載の再生装置は、前記課題を解決するために、請求項９乃至請求項１３の何れか一項に記載の再生装置において、前記選択手段は、初期設定状態においては、前記記憶手段に記憶された初期設定情報に基づいて記録方式の選択を行うように設定されていることを特徴とする。

【００４４】請求項１４に記載の再生装置によれば、初期設定状態においては、前記記憶手段に予め記憶された初期設定情報に基づいて、前記選択手段による記録方式の選択が行われる。従って、ユーザの手を煩わせることなく、その再生装置に適合した記録方式により適切な再生が可能である。

【００４５】請求項１５に記載の再生装置は、前記課題を解決するために、請求項９乃至請求項１１の何れか一項に記載の再生装置において、前記記憶手段に記憶された設定情報の内容を書き換える書換手段と、前記指定情報又は前記設定情報に基づき、前記選択手段により選択される前記記録方式が、当該再生装置では処理できない場合には、警告表示を行う警告表示手段と、初期設定状態においては、前記記憶手段に予め記憶された初期設定情報に基づいて記録方式の選択を行うように設定されている選択手段とを備え、該選択手段は、更に、前記警告表示手段による前記警告表示が行われない限り、まず前記入力手段により入力された指定情報、次に前記書換手段により書き換えられた設定情報、最後に前記初期設定情報、という優先順位で夫々の情報に基づく記録方式の選択を行うように設定されていることを特徴とする。

【００４６】請求項１５に記載の再生装置によれば、記録方式は、ユーザがリアルタイムに指定した情報、またはユーザが予め書き換えた設定情報、あるいは初期設定情報の何れかに基づいて、選択手段により選択されることになるが、この選択処理には、優先順位が設けられている。この優先順位は、再生装置自信の能力、リアルタイムのユーザの指定、ユーザによる設定情報の書き換え、初期設定の順序となっている。従って、再生装置自信の能力が最優先されるため、再生装置に適合しない記録方式が選択されることがない。また、ユーザによる指定または書き換えが行われない場合には、初期設定情報により適切な記録方式が選択される。しかし、この情報は、ユーザの要求に応じて適宜に書き換え可能であり、更にこのような書き換えが行われた場合でもリアルタイムで指定可能なので、再生装置に適合した記録方式の選択を行いつつ、最大限ユーザの要求を反映させた適切な再生を行うことができる。

【００４７】請求項１６に記載の再生装置は、前記課題を解決するために、請求項９乃至請求項１５の何れか一項に記載の再生装置において、ヘッドフォンプラグのヘッドフォンジャックに対する挿入状態を検出する検出手段を更に備え、前記再生手段は、該検出手段によりヘッドフォンプラグがヘッドフォンジャックに挿入されたことを検出した場合には、バイノーラル録音された音情報を再生するように設定されていることを特徴とする。

【００４８】請求項１６に記載の再生装置によれば、ユーザがヘッドフォンプラグをヘッドフォンジャックに挿入すると、この挿入は検出手段により検出され、バイノーラル録音された音情報を検索する。従って、再生しようとする情報記録媒体に、バイノーラル録音された音情報が記録されている場合には、特にこのバイノーラル録音された音情報を指定する操作を行わなくても、ヘッドフォン再生に適合したバイノーラル録音された音情報が

再生されることになる。従って、ユーザによる煩雑な操作を不要としつつ、使用状況に応じた適切な再生を行うことが可能である。

【００４９】

【発明の実施の形態】以下、図面を参照して本発明の好適な実施形態について説明する。

【００５０】（１）ＤＶＤビデオフォーマット

始めに、映像情報及び音声情報（音楽情報も含む。以下、同じ）のビデオＤＶＤ上における記録フォーマット（物理的記録フォーマット）について、図１を用いて説明する。

【００５１】（1.1）物理フォーマット

図１に示すように、ビデオＤＶＤ１は、その最内周部にリードインエリアＬＩを有すると共にその最外周部にリードアウトエリアＬＯを有しており、その間がビデオビデオゾーンであり、映像情報及び音声情報が、夫々にＩＤ（識別）番号を有する複数のＶＴＳ（Video Title Set）４（ＶＴＳ＃１乃至ＶＴＳ＃ｎ）に分割されて記録されている。ここで、ＶＴＳとは、関連する（それに含まれる音声情報及び副映像情報の数や、仕様、対応言語等の属性が同じ）タイトル（映画等の、製作者が視聴者に提示しようとする一つの作品）を一まとめにしたセット（まとまり）である。リードインエリアＬＩのすぐ外周には当該ディスク内に記録されるファイルのフォーマットを管理する情報を有するＵＤＦ（Universal Disk Format）２が記録され、それに続いてＶＭＧ（Video Manager）３が記録される。このＶＭＧ３として記録される情報は、例えば、ユーザに対する選択項目を示すメニューや、違法コピー防止のための情報、又は夫々のタイトルにアクセスするためのアクセステーブル等、当該ビデオＤＶＤ１に記録される映像情報及び音声情報の全体に係わる管理情報である。

【００５２】一のＶＴＳ４は、ＶＴＳＩ（Video Title Set Information）１１を先頭として、夫々にＩＤ番号を有する複数のＶＯＢ（Video OBject）１０に分割されて記録されている。ここで、複数のＶＯＢ１０により構成されている部分をＶＯＢセット（ＶＯＢＳ）という。

【００５３】ＶＴＳ４の先頭に記録されるＶＴＳＩ１１には、複数のセル（セルについては後述する。）を組みあわせた論理的区分であるプログラムチェインに関する種々の情報であるＰＧＣＩ（Program Chain Information）等の情報が記録される。また、各ＶＯＢ１０には、映像情報及び音声情報の実体部分が記録される。

【００５４】一のＶＯＢ１０は、夫々にＩＤ番号を有する複数のセル２０により構成されている。一のセル２０は、夫々にＩＤ番号を有する複数のＶＯＢユニット（ＶＯＢＵ）３０により構成される。ここで、ＶＯＢＵ３０とは、映像情報、音声情報及び副映像情報（映画における字幕等の副映像の情報をいう。）のいずれか又は後述のナビパックのみにより構成される一つの単位である。

【００５５】一のＶＯＢＵ３０は、ＶＯＢＵ３０に含まれる映像情報等を制御対象とする制御情報が格納されているナビパック４１と、映像情報としてのビデオデータを含むビデオパック４２と、音声情報としてのオーディオデータを含むオーディオパック４３と、副映像情報としてのサブピクチャデータを含むサブピクチャパック４４とにより構成されている。ここで、ビデオデータとしては映像データのみが記録され、オーディオデータとしては音声データのみが記録される。また、サブピクチャデータとしては副映像としての文字や図形等のグラフィックデータのみが記録される。

【００５６】各パックＰの先頭に記録されるパックヘッダには、夫々のパックＰに含まれているデータを後述の再生装置におけるトラックバッファから読み出して夫々のバッファへの入力を開始すべき再生時間軸上の読み出し開始時刻を示すＳＣＲ（System Clock Reference）と呼ばれる読み出し開始時刻情報や、パックＰの開始であることを示すスタートコード等が記録される。

【００５７】ナビパック４１は、再生表示させたい映像又は音声等を検索するための検索情報（具体的には、当該再生表示させたい映像又は音声等が記録されているＤＶＤ１上のアドレス等）であるＤＳＩ（Data Search Information）データ５１と、ＤＳＩデータ５１に基づいて検索された映像又は音声を再生表示する際の再生表示制御に関する情報であるＰＣＩ（Presentation Control Information）データ５０とにより構成される。

【００５８】一のＶＯＢＵ３０に含まれている全てのビデオパック４２は、一又は複数のＧＯＰ（Group Of Picture）により構成されている。上記ＧＯＰは、本実施の形態におけるＤＶＤ１に映像情報を記録する際に採用されている画像圧縮方式であるＭＰＥＧ２（Moving Picture Experts Group ２）方式の規格において定められている単独で再生可能な最小の画像単位である。

【００５９】以上説明した図１に示す階層構造の記録フォーマットにおいて、夫々の区分は、ＤＶＤ１内に記録させる記録情報の製作者（以下、単に製作者という。）がその意図に応じて自在に区分設定をして記録させるものである。これらの区分毎に後述の論理構造に基づいて再生することにより、変化に富んだ種々の再生が可能となる。

【００６０】（1.2）論理フォーマット次に、図１に示す物理的な区分により記録された情報を組みあわせた論理的フォーマット（論理構造）について図２を用いて説明する。なお、図２に示す論理構造は、その構造で実際にＤＶＤ１上に情報が記録されているのではなく、図２に示す論理構造で図１に示す各データ（特にセル２０）を組み合わせて再生するための再生制御情報（アクセス情報又は時間情報等）がＤＶＤ１上の、特にＶＴＳＩ１１の中に記録されているものである。

【００６１】説明の便宜上、図２の下位の階層から説明

していくと、上記図１において説明した物理構造のうち、複数のセル２０を選択して組み合わせることにより、一のプログラム６０が論理上構成される。なお、このプログラム６０を一又は複数個纏めたものを視聴者が自由に選択して視聴することができる最小単位として製作者が定義することもでき、この単位をＰＴＴ（Part of Title）という。

【００６２】ここで、一のセル２０の番号については、当該セル２０を図１に示す物理フォーマットにおいて取り扱う際にはセルＩＤ番号として取り扱われ（図１中、セルＩＤ＃と示す。）、図２に示す論理フォーマットにおいて取り扱う際には後述のＰＧＣＩ中の記述順にセル番号として取り扱われる。

【００６３】複数のプログラム６０を組みあわせて一のＰＧＣ（Program Chain）６１が論理上構成される。このＰＧＣ６１の単位で、前述したＰＧＣＩが定義され、当該ＰＧＣＩには、夫々のプログラム６０を再生する際の各プログラム６０毎のセル２０の再生順序（この再生順序により、プログラム６０毎に固有のプログラム番号が割当てられる。）、夫々のセル２０のＤＶＤ１上の記録位置であるアドレス、一のプログラム６０における再生すべき先頭セル２０の番号、などが含まれている。

【００６４】一のＰＧＣ６１には、上記ＰＧＣＩの他に、実体的な映像及び音声等のデータがプログラム６０の組みあわせとして（換言すれば、セル２０の組みあわせとして）含まれることとなる。

【００６５】一又は複数のＰＧＣ６１により、一のタイトル６２が論理上構成される。このタイトル６２は、例えば、映像情報で言えば映画一本に相当する単位であり、製作者がＤＶＤ１の視聴者に対して提供する完結した情報である。

【００６６】一又は複数のタイトル６２により、一のＶＴＳ６３が論理上構成される。

【００６７】図２に示す一のＶＴＳ６３に相当する情報は、図１に示す一のＶＴＳ４に含まれている情報に対応している。すなわち、ＤＶＤ１には、図２に示すＶＴＳ６３内に論理上含まれる全ての情報が一のＶＴＳ４として纏めて記録されていることとなる。

【００６８】以上説明した論理フォーマットに基づいて、物理構造において区分された情報を製作者が指定することにより、視聴者が見るべき映像又は音楽が形成される。

【００６９】（２）ＤＶＤオーディオフォーマット

次にオーディオ情報（音楽及び音声情報をも含む。以下、同じ）のオーディオＤＶＤ上における記録フォーマット（物理的記録フォーマット）について、図３を用いて説明する。

【００７０】（2.1）物理フォーマット

始めに、オーディオＤＶＤ上における物理フォーマット（物理的記録フォーマット）について、図３を用いて説明する。

【００７１】先ず、図３に示すように、実施形態のオーディオＤＶＤ２００は、その最内周部にリードインエリアＬＩを有すると共にその最外周部にリードアウトエリアＬＯを有し、その間は、一のボリュームスペースとなっている。この中に、必ずオーディオゾーンが記録される。このオーディオゾーンに、音声情報が、夫々にＩＤ（識別）番号を有する複数のＡＴＳ（Audio Title Set）２０３（ＡＴＳ＃１～ＡＴＳ＃ｎ）に分割されて記録されている。オーディオゾーンの先頭には簡易再生（２チャンネル再生など）のための再生制御情報としてのＳＡＰＰＴ（Simple Audio Play Pointer Table）２０４が記録されている。このＳＡＰＰＴはオーディオゾーンを有する全てのＤＶＤディスクに記録されている。なお、ＳＡＰＰＴ２０４はリードインエリアＬＩや後述のＡＭＧ２０２中に記録しておいても良い。

【００７２】リードインエリアＬＩのすぐ外周部には、当該ディスク内に記録されるファイルのフォーマットを管理する情報を有するＵＤＦ（Universal Disk Format）２０１が記録され、ＵＤＦ２０１に続いてＳＡＰＰＴ２０４が記録され、続いてＡＭＧ（Audio Manager）２０２が記録される。しかし、ＵＤＦ２０１，ＳＡＰＰＴ２０４，その他のファイルの配置は、必ずこの順でなくてはならないというものではない。

【００７３】このＳＡＰＰＴ２０４に記録される情報は、ＬＰＣＭデータを２ｃｈで再生するのに必要な情報である。またＡＭＧ２０２として記録される情報は、例えば、ユーザに対して項目選択を促すためのメニューや、違法コピー防止のための情報、又は夫々のタイトルにアクセスするためのアクセステーブル等、当該オーディオＤＶＤ２００に記録されている音声情報の全体に係わる管理情報である。

【００７４】一のＡＴＳ２０３は、ＡＴＳＩ（Audio Title Set Information）２１１を先頭として、夫々にＩＤ番号を有する複数のＡＯＢ（Audio Object）２１０から構成される。

【００７５】ここで、複数のＡＯＢ２１０により構成されている部分をＡＯＢセット（ＡＯＢＳ）という。このＡＯＢセットは音声情報の実体部分である。

【００７６】ＡＴＳ２０３の先頭に記録されるＡＴＳＩ２１１には、複数のセル（セルについては後述する。）を組みあわせた論理的区分であるプログラムチェインに関する種々の情報である再生制御情報としてのＡＰＧＣＩ（Audio Program Chain Information）等の情報が記録される。また、各ＡＯＢ２１０には、音声情報の実体部分が記録される。一のＡＯＢ２１０は、夫々にＩＤ番号を有する複数のセル２２０により構成されている。

【００７７】一のセル２２０は、夫々パック化された複数のオーディオパック２３０または、オーディオパックとリアルタイム情報パック（Real Time Information Pa

ck）２３１により構成される。オーディオパック２３０は、オーディオＤＶＤに記録されるべき音声情報を所定の大きさ毎にパック化したものであり、例えばリニアＰＣＭなどによりデジタル化されたオーディオ情報が含まれる。リアルタイム情報パック２３１には、テキスト情報、ＢＰＭ（Beat Per Minutes）、拍情報、等が含まれる。

【００７８】以上説明した図３に示す階層構造の記録フォーマットにおいて、夫々の区分は、オーディオＤＶＤ２００内に記録させる記録情報の製作者（以下、単に製作者という。）がその意図に応じて自在に区分設定をして記録できるものである。これらの区分毎に後述の論理構造に基づいて再生することにより、変化に富んだ種々の再生が可能となる。

【００７９】（2.2）論理フォーマット

次に、図３に示す物理的な区分により記録された情報を組みあわせた論理的フォーマット（論理構造）について図４を用いて説明する。

【００８０】なお、図４に示す論理構造は、その構造で実際にオーディオＤＶＤ２００上に情報が記録されているのではない。オーディオＤＶＤ上にはあくまで図３に示す物理フォーマットで音声情報が記録されており、この音声情報を再生するための情報が図４に示す論理フォーマットで、前述したＳＡＰＰＴ２０４、ＡＭＧ２０２、ＡＴＳＩ２１１に記録されているのである。

【００８１】説明の便宜上図４の下位の階層から説明していくと、上記図３において説明した物理構造のうち、一のセルまたは複数のセル２２０を選択して組みあわせることにより、インデックス２５９を構成する。インデックスは、曲番としても使うことができ、ユーザによって、アクセス可能な最小の単位である。

【００８２】一の又は複数のインデックス２５９により一のトラック２６０が論理上構成される。このトラック２６０は一つの曲に相当する情報単位である。ユーザは任意のトラック（曲）を選択し、ダイレクトにアクセスすることができる。

【００８３】ここで、一のセル２２０の番号については、当該セル２２０を図３に示す物理フォーマットにおいて取り扱う際にはセルＩＤ番号として取り扱い（図３中、セルＩＤ＃と示す。）、図４に示す論理フォーマットにおいて取り扱う際には後述のＡＰＧＣＩ中の記述順にセル番号として取り扱う。

【００８４】トラック２６０（曲）は、複数のセルを含む情報単位であり、ある共通の属性などを有するセルの集合である。すなわちトラック内の全てのセルの属性は、すべて同一である。また、トラックに含まれる全てのセルは、同一のオブジェクト内に、隣接して記録される。

【００８５】一の又は複数のトラック２６０を組みあわせて一のタイトル２６１が論理上構成される。但し、ユーザから、このタイトル自体が、アクセスの単位として認識されることはない。従って、タイトル番号を指定して任意のタイトルにアクセスすることはできない。

【００８６】オーディオＤＶＤでは、タイトル２６１を構成する各トラック２６０の属性を最大８パターンの中で独立に定義することができる。すなわち各トラック（曲）毎に、チャンネル数、量子化方法、サンプリング周波数など音声情報としての属性を変更してもよい。

【００８７】このタイトル２６１の単位で、前述したＡＰＧＣＩが定義され、当該ＡＰＧＣＩには、各トラックの属性、夫々のトラック２６０を再生する際の各トラック２６０毎のセル２２０の再生順序、夫々のセル２２０のオーディオＤＶＤ２００上の記録位置であるアドレス、一のトラック２６０における再生すべき先頭セル２２０の番号、各トラック２６０の再生方式及び各種コマンドが含まれている。

【００８８】一のタイトル２６１には、上記ＡＰＧＣＩの他に、実体的な音声情報がトラック（曲）２６０の組みあわせとして（換言すれば、セル２２０の組みあわせとして）含まれることとなる。

【００８９】一又は複数のタイトル２６１により、一のタイトルグループ２６２が論理上構成される。また、タイトルグループ２６２は、ユーザがアクセスできる最大の単位で、１ボリューム中、最大９個まで定義することができる。このタイトルグループ２６２は、ある一定の関連性に基づいて集合された１又は複数のタイトル２６１により構成され、タイトルグループ内の全てのタイトルは、連続的に再生される。例えば、ある歌手、作曲家の曲集などを一つのタイトルグループとして集合させることができる。

【００９０】一又は複数のタイトルグループ２６２により、一のボリューム２６３が論理上構成される。このボリューム２６３は一枚のアルバム（ＤＶＤ）に相当する情報単位である。

【００９１】図４に示す一のタイトルに含まれる実際の音声情報は、オーディオＤＶＤ上では図３に示すいずれか一のＡＴＳ２０３内に記録されていることになる。

【００９２】以上説明した論理フォーマットに基づいて、物理構造において区分された情報を製作者が指定することにより、視聴者が聞く音楽が形成される。

【００９３】（３）ＤＶＤの種類

次に、ＤＶＤにおけるディスクの種類について説明する。なお、以下の説明においては、ＤＶＤ上に記録される情報に関し、映画のように映像と音声の両方を含む情報を「ＡＶ情報」と呼ぶことがあり、その映像部分のみの情報を「ビデオ（又は映像）情報」と呼ぶ。また、映画などのＡＶ情報の音声部分のみ及び音楽のような音声情報のみの情報を「オーディオ（又は音声）情報」と呼ぶ。

【００９４】また、これらの各種のＤＶＤディスクを再

生するＤＶＤプレーヤとしては、ＤＶＤビデオフォーマットによるＡＶ情報の再生が可能なビデオＤＶＤプレーヤ（以下、「ビデオプレーヤ」と呼ぶ。）、ＤＶＤオーディオフォーマットによるオーディオ情報を各種再生形態で再生するオーディオＤＶＤプレーヤ（以下、「オーディオプレーヤ」と呼ぶ。）、ＤＶＤオーディオフォーマットによるＬＰＣＭオーディオ情報を２ｃｈで再生する簡易オーディオＤＶＤプレーヤ（以下、「簡易オーディオプレーヤ」と呼ぶ。）、及び、ＤＶＤビデオフォーマットのＡＶ情報とＤＶＤオーディオフォーマットのオーディオ情報のどちらも再生可能なコンパチブルＤＶＤプレーヤ（以下、「コンパチブルプレーヤ」と呼ぶ。）の４種類がある。それぞれのＤＶＤプレーヤについては後で詳細に説明する。

【００９５】ＡＶ情報またはオーディオ情報を記録するＤＶＤとして、ビデオＤＶＤ、オーディオナビゲーション付きビデオＤＶＤ、オーディオオンリーＤＶＤ、オーディオ・ビデオ両用ＤＶＤの４種類のディスクが存在する。図５に、４種類のＤＶＤの物理フォーマットを概略的に示す。

【００９６】なお、これらのＤＶＤはディスク形状や情報記録方式（変調方法、トラックピッチ、ビットサイズ等）は全て同一であり、情報の内容（コンテンツ）が異なるだけである。

【００９７】（3.1）ビデオＤＶＤ

図５において最上段に示すのは、ビデオＤＶＤである。このディスクにはＤＶＤビデオフォーマットにしたがった映画などのビデオ情報及びそれと同時に再生されるオーディオ情報（即ち、ＡＶ情報）が記録されている。従って、リードインエリアＬＩとリードアウトエリアＬＯとの間の記録領域には、ビデオゾーンしか存在せず、再生制御情報、ビデオ情報及びオーディオ情報が複数のＶＴＳに含めて記録され、それらＶＴＳの管理情報を含むＶＭＧが記録されている。図１を参照して説明したように、ビデオ情報はビデオバックとして、オーディオ情報はオーディオバックとして記録される。

【００９８】このビデオＤＶＤは、ＶＭＧに記録されている管理情報の中に含まれるナビゲーション情報（再生のための制御情報を規定する情報。後に詳述する。）に基づいてビデオプレーヤ及びコンパチブルプレーヤにより再生される。しかし、ＤＶＤオーディオフォーマットによるナビゲーション情報が記録されていないため、オーディオプレーヤでは再生できない。

【００９９】（3.2）オーディオナビゲーション付きビデオＤＶＤ

２段目に示すのはオーディオナビゲーション付きビデオＤＶＤと呼ばれるビデオディスクの一種である。このオーディオナビゲーション付きビデオＤＶＤは、ビデオプレーヤでＤＶＤビデオフォーマットによる映画などのビデオ情報（付随するオーディオ情報を含む）の再生が可能なことに加え、ＤＶＤオーディオフォーマットによるナビゲーション情報も記録したことにより、オーディオプレーヤで、ＶＴＳ内のＶＯＢのＡＶ情報のオーディオ情報のみを再生することを可能にしたディスクである。また、オーディオプレーヤによりオーディオ情報のみを再生することが可能なＡＶ情報の部分をオーディオプレイパートと呼ぶ。

【０１００】オーディオナビゲーション付きビデオＤＶＤの記録形態は、図１に示すＤＶＤビデオフォーマットに準拠して、ビデオゾーン内にＡＶ情報が複数のＶＴＳの形態で記録されている。これに加え、オーディオナビゲーション付きビデオＤＶＤは、オーディオゾーンとしてビデオゾーンの前方に、ＤＶＤオーディオフォーマットに準拠した、ＶＴＳ内のオーディオ情報のみを再生するために必要な再生制御情報を含むＡＴＳＩがＡＴＳとして記録され、ＡＴＳの管理情報としてのＡＭＧが記録されている。ＡＴＳ内にはオーディオ情報の実体部分であるＡＯＢは記録されない。即ち、このＡＭＧ及びＡＴＳＩには、オーディオナビゲーション付きビデオＤＶＤ内の各ＶＴＳに含まれるオーディオ情報（具体的には、各ＶＯＢ内のオーディオプレイパートオーディオパック（図１参照））をオーディオプレーヤで再生するためのナビゲーション情報が記述されている。

【０１０１】また、オーディオゾーンの先頭にはＳＡＰＰＴが記録されている。このＳＡＰＰＴには、ＶＴＳに含まれるＬＰＣＭオーディオ情報を２ｃｈで再生するためのナビゲーション情報が記述されている。

【０１０２】このオーディオナビゲーション付きビデオＤＶＤは、ＶＭＧに記録されているナビゲーション情報に基づいてビデオプレーヤ及びコンパチブルプレーヤで再生される。また、ＡＭＧ内に記録されているナビゲーション情報に基づいてオーディオプレーヤでオーディオプレイパートのオーディオ情報がプレーヤの能力に応じて各種再生形態で再生される。また、ＳＡＰＰＴに記録されているナビゲーション情報に基づいて簡易オーディオプレーヤでオーディオプレイパートのＬＰＣＭ情報が２ｃｈで再生される。

【０１０３】（3.3）オーディオオンリーＤＶＤ

３段目に示すのは、オーディオオンリーＤＶＤである。このディスクには、若干の静止画像やテキスト情報を除いてオーディオ情報のみが記録されている。従って、リードインエリアＬＩとリードアウトエリアＬＯとの間の記録領域には、オーディオゾーンしか存在せず、ＡＴＳＩ、ＡＯＢが複数のＡＴＳとして記録され、それらＡＴＳの管理情報を含むＡＭＧが記録されている。さらにリードインエリアＬＩ又はオーディオゾーンにはＳＡＰＰＴが記録されている。

【０１０４】また、各ＡＴＳはオーディオ情報の実体部分である１又は複数のＡＯＢを含んでいる。このオーディオオンリーＤＶＤは、ＡＭＧに記録されているナビゲ

ーション情報に基づいてオーディオプレーヤ及びコンパチブルプレーヤでオーディオゾーン内のオーディオ情報がプレーヤの能力に応じて各種再生形態で再生される。また、ＳＡＰＰＴに記録されているナビゲーション情報に基づいて簡易オーディオプレーヤでオーディオゾーン内のＬＰＣＭ情報が２ｃｈで再生される。しかし、ＤＶＤビデオフォーマットによるナビゲーション情報が記録されていないため、ビデオプレーヤでは再生できない。

【０１０５】（3.4）オーディオ・ビデオ両用ＤＶＤ

図５の最下段に示すのはオーディオ・ビデオ両用ＤＶＤと呼ばれるものである。リードインエリアＬＩとリードアウトＬＯの間には、オーディオゾーンとビデオゾーンがある。ビデオゾーンにはビデオＤＶＤと同様にＤＶＤビデオフォーマットに準拠して、ＶＭＧ、再生制御情報及び実体としてのＡＶ情報（ＶＯＢ）を含むＶＴＳが記録されている。リードインエリアＬＩ又はオーディオゾーンにはＳＡＰＰＴが記録されている。

【０１０６】オーディオゾーンにはオーディオオンリーＤＶＤと同様に、ＤＶＤオーディオフォーマットに準拠して、ＳＡＰＰＴ，ＡＭＧ、再生制御情報及び実体としてのオーディオ情報を含む複数のＡＴＳ（図ではＡＴＳ＃１、＃２）が記録される。さらに、ビデオゾーンのＶＴＳ内のＶＯＢのオーディオ情報のみを再生するための再生制御情報だけを含むＡＴＳ（図ではＡＴＳ＃３）も記録されている。すなわち、オーディオ・ビデオ両用ＤＶＤにおいては、ＤＶＤビデオフォーマットによるＡＶ情報とＤＶＤオーディオフォーマットによるオーディオ情報は、別々の領域に記録される。

【０１０７】オーディオ・ビデオ両用ＤＶＤの場合は、ＡＭＧはオーディオゾーン内の全てのＡＴＳの管理情報を含んでいるだけでなく、オーディオゾーンとビデオゾーン内の全てのＡＴＳ及びＶＴＳを絡めた管理情報を含んでいる。またＳＡＰＰＴも、オーディオゾーンとビデオゾーン内の全てのＡＴＳ及びＶＴＳを絡めた管理情報を含んでいる。但し、その管理情報は、両ゾーンの２ｃｈで再生できるＬＰＣＭデータに関するものだけである。

【０１０８】ここで、オーディオ・ビデオ両用ＤＶＤがオーディオナビゲーション付きビデオディスク及びオーディオオンリーＤＶＤと異なる点は、ディスクの記録領域がオーディオゾーンとビデオゾーンに区分され、夫々にＤＶＤビデオフォーマットによるＡＶ情報とＤＶＤオーディオフォーマットによるオーディオ情報が記録されているという点と、オーディオゾーンに記録されるＡＭＧ、及びＳＡＰＰＴがディスク内の全てのＡＴＳおよびＶＴＳを絡めた管理情報を含んでいるという点である。

【０１０９】より詳しく説明すると、オーディオナビゲーション付きビデオディスクでは、オーディオ情報は、ＤＶＤビデオフォーマットに基づいて、ＶＯＢの中にパック単位にビデオ情報と多重されて記録されている。そして、ＶＯＢ内に記録されたオーディオ情報を再生するための再生制御情報であるＡＰＧＣＩがＡＴＳＩとしてＡＴＳが構成され、これらのＡＴＳだけをＡＭＧにより管理する。ＡＭＧにはビデオゾーン内のタイトルの管理情報は記録されない。同様にＳＡＰＰＴにもビデオゾーンのオーディオプレイバートに関するナビゲーション情報が記述される。

【０１１０】これに対し、オーディオ・ビデオ両用ＤＶＤではＤＶＤオーディオフォーマットによるオーディオ情報とＤＶＤビデオフォーマットによるＡＶ情報の記録される領域が別個に存在する。オーディオゾーンには、図３に示したＤＶＤオーディオフォーマットによりオーディオ情報の実体部分が複数のＡＯＢとして各ＡＴＳに記録される。さらに、各ＡＴＳ内のオーディオ情報の再生制御情報であるＡＰＧＣＩをＡＴＳＩ内に記録したＡＴＳだけでなく、ビデオゾーンのＶＴＳ内のＶＯＢに記録されたオーディオ情報の再生制御情報をＡＰＧＣＩとしてＡＴＳＩ内に記録したＡＴＳ（オーディオ実体情報がビデオ領域内にあり、ナビゲーション情報であるＡＴＳＩのみがＡＴＳとして存在している。）の二種類のＡＴＳが記録されている。すなわちゾーンに関わらずオーディオ情報の再生に関わる再生制御情報の全てをＡＴＳをＡＭＧにより管理する。さらに、全てのＡＴＳ，ＶＴＳに記録されているＬＰＣＭオーディオ情報の再生に関わる再生制御情報のうち２ｃｈで再生することのできるトラックに関する情報がＳＡＰＰＴに記録されている。

【０１１１】一方、ビデオゾーン内は、ＡＶ情報が複数のＶＴＳとして記録され、さらに各ＶＴＳ内のＡＶ情報の再生制御情報をＰＧＣＩとしてＶＴＳＩ内に記録し、これらＶＴＳ全てをＶＭＧで管理している。一方、ＡＭＧでもビデオゾーンのＡＶ情報再生に関する再生制御情報の全てを管理している。

【０１１２】具体的には、オーディオオンリーＤＶＤ、オーディオ・ビデオ両用ＤＶＤの場合には、ＡＭＧが総合管理情報となり、ビデオＤＶＤの場合には、ＶＭＧが主たる管理情報となる。オーディオナビゲーション付きビデオＤＶＤの場合、ＡＭＧはオーディオプレーヤによるＶＯＢ内のオーディオ情報だけの再生についてのみ管理しており、ビデオタイトルの管理は行わない。

【０１１３】またオーディオオンリーＤＶＤ、オーディオ・ビデオ両用ＤＶＤの場合には、ＳＡＰＰＴは、例えば簡易型、ポータブル型オーディオプレーヤ等による、ＬＰＣＭオーディオ情報を２ｃｈで再生するための総合管理情報となる。ビデオＤＶＤの場合には、ＳＡＰＰＴが無いためＬＰＣＭで記録されていても、簡易プレーヤによる、オーディオ情報だけの再生を行うことはない。オーディオナビゲーション付きビデオＤＶＤの場合、ＳＡＰＰＴは簡易オーディオプレーヤによるＶＯＢ内のオーディオプレイバートのＬＰＣＭオーディオ情報（オーディオオンリータイトル）の再生についてのみ管理して

おり、ビデオタイトルの管理は行わない。

【０１１４】このような構造をとることで、再生装置の能力に応じて最適な再生ができ、なおかつ各ディスクと各再生装置との間で整合性のある互換性が、実現されている。

【０１１５】（４）タイトルの再生制御

次に、タイトルの再生制御についてさらに詳しく説明する。ここで、タイトルとは、ＤＶＤに記録されるＡＶ情報、オーディオ情報等の実体情報と、その再生手順を示す再生制御情報とから構成される、再生形態の共通な一連の作品（プレゼンテーション）または作品の一部を指す。オーディオＤＶＤの物理及び論理フォーマットで述べたように、ユーザは、直接タイトルを選択し再生を開始するようプレーヤに指示することはない。ユーザは、１つ又は、複数のタイトルから成るタイトルグループを選択し、再生を開始する。しかしプレーヤは、指示されたタイトルグループが、どのようなタイトルから構成されるかをＡＭＧ及びＡＴＳＩ内のナビゲーション情報から判断し、各タイトルの再生を連続的に行うことにより、タイトルグループの再生を行っている。従ってＤＶＤプレーヤにおいては、タイトルの再生が基本となる。そこでＤＶＤオーディオフォーマットにおけるタイトル、及びタイトルの再生制御についてオーディオビデオ両用ディスクを例に説明する。

【０１１６】（4.1）タイトルの種類

まず、ＤＶＤオーディオフォーマットにおけるタイトル（図４のタイトル２６１）は、オーディオ領域内の音声情報の再生により構成されるオーディオタイトル（以後「ＡＯＴＴ（Audio Only TiTle）」とも呼ぶ）と、ビデオ領域内のＡＶ情報の再生により構成されるビデオタイトルとに分類される。またビデオタイトルは、画像専用タイトル（以後「ＡＶＴＴ（Audio Video TiTle）」とも呼ぶ）と、画像音声両用タイトル（以後「ＡＶＴＴ／ＡＯＴＴ（Audio Video TiTle /Audio Only TiTle）」とも呼ぶ）の２種類に分類される。なお、ＤＶＤビデオフォーマットの場合は画像専用タイトルのみである。

【０１１７】ＡＯＴＴは、オーディオ情報のみが再生されるタイトルであり、その実体情報はオーディオゾーン内のＡＯＢに記録されたオーディオ情報により構成される。

【０１１８】ＡＶＴＴは、オーディオ情報が必ずビデオ情報を伴って再生されるタイトルであり、その実体情報はビデオゾーン内のＶＯＢに記録されたＡＶ情報により構成される。ＡＶＴＴではオーディオ情報のみの再生は認められず、ビデオ情報と共に再生することが必須となる。

【０１１９】ＡＶＴＴ／ＡＯＴＴは、オーディオ情報のみでも再生することもでき、ＡＶ情報としてビデオ情報と共にオーディオ情報を再生することもできるタイトル（即ち、両用タイトルということができる）であり、いずれの場合もその実体情報はビデオゾーン内のＶＯＢに記録されたＡＶ情報により構成される。

【０１２０】このＡＶＴＴ／ＡＯＴＴが、ＡＶ情報、オーディオ情報のどちらとして再生されるかは、再生装置の能力に依存する。すなわち、ＡＶ情報の再生能力を有しない再生装置（オーディオプレーヤ）ではＡＶＴＴ／ＡＯＴＴをオーディオ情報のみで再生し、ＡＶ情報の再生能力を有する再生装置（ビデオプレーヤ及びコンパチブルプレーヤ）ではＡＶＴＴ／ＡＯＴＴをビデオ情報と共にオーディオ情報を伴って再生する。

【０１２１】ところで、ＡＭＧには、オーディオプレーヤ用のナビゲーション情報と、コンパチブルプレーヤ用のナビゲーション情報の２つのナビゲーション情報を別個に記録している。オーディオプレーヤ用のナビゲーション情報は、オーディオゾーンのＡＯＢ内のオーディオ情報により構成されるオーディオタイトル（ＡＯＴＴ）及びビデオゾーンのＶＯＢ内のＡＶ情報により構成される両用タイトルの音声情報だけを再生するためのナビゲーション情報を記述したオーディオオンリータイトルサーチポインタであり、これはオーディオオンリータイトルサーチポインタテーブル（ＡＯＴＴ＿ＳＲ）に記録される。一方、全ての種類のタイトルを再生可能なコンパチブルプレーヤ用のナビゲーション情報であるオーディオタイトルサーチポインタは、オーディオタイトルサーチポインタテーブル（ＡＴＴ＿ＳＲ）に記録される。これらのナビゲーション情報については図８の説明にてさらに詳述する。

【０１２２】このオーディオ・ビデオ両用ＤＶＤをビデオプレーヤで再生する場合には、ビデオゾーン内のＶＭＧ及びＶＴＳＩに記録されているビデオプレーヤ用のナビゲーション情報に従って各ＶＴＳ内のＡＶ情報を再生する。

【０１２３】また、このオーディオ・ビデオ両用ＤＶＤをオーディオプレーヤで再生する場合には、オーディオゾーン内のＡＭＧ内のＡＯＴＴ＿ＳＲを参照し、ＡＴＳＩに記録されているオーディオプレーヤ用の再生制御情報に従ってオーディオ情報を再生する。オーディオプレーヤによりオーディオ情報を再生する場合には、２つの場合がある。一つは、オーディオゾーンのＡＭＧ及びＡＴＳ内のナビゲーション情報であるＡＴＳＩ、ＡＰＧＣＩに従ってＡＯＢ内のオーディオ情報を再生する場合であり、もう一つは、オーディオナビゲーション付きビデオディスクと同様に、ＡＭＧ及びＡＴＳＩ、ＡＰＧＣＩに従ってビデオゾーン内のＶＴＳに記録されたオーディオ情報を再生する場合である。後者の場合は、同じオブジェクトに対して、ビデオプレーヤでは画像を伴うＡＶ情報として再生し、オーディオプレーヤではオーディオ情報のみを再生する。

【０１２４】さらに、このオーディオ・ビデオ両用ＤＶＤをコンパチブルプレーヤで再生する場合には、オーデ

ィオゾーン内のＡＭＧ内のコンパチブルプレーヤ用のナビゲーション情報であるＡＴＴ＿ＳＲを参照し、ＡＴＳＩ、ＶＴＳＩに記録されている再生制御情報に従って、オーディオゾーン内のオーディオ情報及びビデオゾーン内のＡＶ情報が統合的に再生される。

【０１２５】オーディオ・ビデオ両用ＤＶＤにおけるタイトルは、全てＡＭＧにより管理されており、ＤＶＤオーディオフォーマットの上記３種類のタイトルのいずれかに分類される。今、ＤＶＤオーディオフォーマット及びＤＶＤビデオフォーマットの両方の再生能力を有するコンパチブルプレーヤを使用して図６に示す論理フォーマット例を有するオーディオ・ビデオ両用ＤＶＤを再生する場合を考える。このオーディオ・ビデオ両用ＤＶＤにおいて、ボリュームは＃１～＃７の７つのタイトルグループから構成されており、各タイトルグループは１つのタイトルにより構成されているものとする。１つのタイトルには１又は複数のトラックが含まれている。図６において、左列はコンパチブルプレーヤ用のナビゲーション情報（ＡＴＴ＿ＳＲ）、中央の列はビデオプレーヤ用のナビゲーション情報（ＴＴ＿ＳＲ）、右の列はオーディオプレーヤ用のナビゲーション情報（ＡＯＴＴ＿ＳＲ）のイメージを示したものである。

【０１２６】タイトル＃２及び＃５はＡＯＴＴであるので、これらのタイトルの再生時にはオーディオ・ビデオ両用ＤＶＤのオーディオゾーン内のＡＯＢに記録されたオーディオ情報のみが再生される。

【０１２７】タイトル＃４、＃６及び＃７はＡＶＴＴであるので、オーディオ・ビデオ両用ＤＶＤのビデオゾーン内のＶＯＢ内に記録されたＡＶ情報が再生される。従って、必ず映像及び音声が再生されることになる。

【０１２８】また、タイトル＃１及び＃３はＡＶＴＴ／ＡＯＴＴであるので、コンパチブルプレーヤはオーディオ・ビデオ両用のＤＶＤのビデオゾーン内のＶＯＢに記録されたビデオ及びオーディオ情報に基づき、音声と映像の両方を再生する。なお、ビデオ情報の再生能力を有しないオーディオプレーヤを使用した場合は、タイトル＃１及び＃３では、オーディオ・ビデオ両用ＤＶＤのビデオゾーン内のＶＯＢに記録されたオーディオ情報のみが再生される（図６の右列参照）。即ち、ＡＶＴＴ／ＡＯＴＴタイトルは、当該ＤＶＤディスクを再生しようとする再生装置の能力に応じて、その能力を最大限に発揮できる方法で記録情報を再生するように作成されている。

【０１２９】なお、タイトルグループ再生時の混乱を無くすため、ＡＶＴＴは他の種類のタイトル（ＡＯＴＴ、ＡＶＴＴ／ＡＯＴＴ）とタイトルグループを構成することができないことが約束されている。

【０１３０】（4.2）ＶＯＢの二重管理

次に、オーディオ・ビデオ両用ＤＶＤのビデオゾーン内のＶＯＢに関して規定されるＰＧＣＩ及びＡＰＧＣＩの

概念について説明しておく。ＶＯＢ内には、ビデオ情報及びオーディオ情報が多重された形で記録されている。ＶＯＢをＡＶ情報として再生する場合には、ＰＧＣＩに従って再生することとなり、これは、ビデオＤＶＤの場合と同様の概念である。このようにオーディオＤＶＤにおけるＡＶ情報の記録及び再生の仕方をビデオフォーマットに合わせたため、ビデオプレーヤとの互換性が保たれることになった。これに対しＶＯＢ内のオーディオ情報のみを再生する場合にはＡＰＧＣＩに従って再生を行うが、このＡＰＧＣＩはＰＧＣＩとは独立に規定される。これについて、図７を参照して説明する。

【０１３１】図７はある一つのＶＯＢを、ＰＧＣＩに従ってＡＶ情報として再生する場合と、ＡＰＧＣＩに従ってオーディオ情報のみとして再生する場合のプログラムの概念を示している。図７において、ＶＯＢにはビデオデータ、サブピクチャデータ及びオーディオデータが含まれている。このＶＯＢをＡＶ情報として再生する場合には、その再生制御はＰＧＣＩに基づいて行われる。ＰＧＣＩでは、当該ＶＯＢを６個のビデオセル＃１－＃６に分割し、ビデオセル＃１によりビデオプログラム＃１を、ビデオセル＃２－＃４によりビデオプログラム＃２を、ビデオセル＃６によりビデオプログラム＃３を構成している。ＡＶＴＴ／ＡＯＴＴの如き、ビデオプレーヤやコンパチプレーヤでＡＶ情報を再生する場合は、このようなＰＧＣＩに従って再生が行われる。

【０１３２】一方、同一のＶＯＢからオーディオプレーヤがオーディオ情報のみを再生する場合には、ＡＰＧＣＩに従って再生が行われる。ＡＰＧＣＩにより規定されるオーディオプログラムは夫々１又は２以上のオーディオセルにより構成される。ここで、同一のオブジェクト（ＶＯＢ）に対してであっても、オーディオセルがビデオセルと異なるように（独立に）規定することができる（もちろん一致するように規定することも可能である）。即ち、各オーディオセルの開始位置、終了位置などは、いずれのビデオセルとも独立に設定することができる。また、ＡＰＧＣＩにより規定されるオーディオセルの再生順序は、ＰＧＣＩにより規定されるビデオセルの再生順序と独立に規定することが可能である。

【０１３３】図７の例では、オーディオプログラム＃１はオーディオセル＃１及び＃２により構成され、オーディオプログラム＃２はオーディオセル＃３により構成される。ＡＰＧＣＩは、これらオーディオプログラムに含まれるオーディオセルの記録位置、再生順序などの情報を含んでおり、これに基づいてオーディオ情報の再生が行われる。

【０１３４】このように、オーディオセルをビデオセルと独立に規定することができるようにした理由は、オーディオ情報をＡＶ情報と独立に管理するためである。こうすることにより、ＶＯＢ内のオーディオ情報のみを再生する場合にＡＶ情報とは独立に時間管理などを行うこ

とが可能となる。また、ＡＶ情報に含まれるオーディオ情報のうち、オーディオ情報のみで再生しても意味のある部分のみの再生が可能となる。もちろん同一セルとして定義することであっても良い。

【０１３５】（4.3）タイトルサーチポインター

次にオーディオ・ビデオ両用ＤＶＤにおける、タイトルサーチポインターを用いた、上述の各タイトルの再生について、図６及び図８を参照して説明する。

【０１３６】図８に、オーディオ・ビデオ両用ＤＶＤのナビゲーション情報の例を示す。前述のように、オーディオ・ビデオ両用ＤＶＤは、ＤＶＤビデオフォーマットに従うビデオゾーン及びＤＶＤオーディオフォーマットに従うオーディオゾーンを有する。オーディオ・ビデオ両用ＤＶＤから再生可能な情報は、映画などのＡＶ情報（音声付き映像情報）とオーディオ情報とである。そして、それぞれの情報を各種プレーヤで再生したとき、混乱や矛盾が生じないようにするためのナビゲーション情報が、各プレーヤに対応して別個にオーディオ・ビデオ両用ＤＶＤ上に記録されている。

【０１３７】（4.3.1）ＡＭＧ、ＡＴＳＩ、タイトルサーチポインタテーブル

図８において、オーディオ・ビデオ両用ＤＶＤはオーディオゾーンとビデオゾーンとを有する。オーディオゾーンはＡＭＧ２０２とＡＴＳ＃１、ＡＴＳ＃２、ＡＴＳ＃３から構成され、ＡＴＳ＃１はＡＴＳＩ２１１と、ＡＯＢ２１０とから構成され、ＡＴＳ＃３はＡＴＳＩ２１２だけから構成される。また、ビデオゾーンはＶＭＧ３とＶＴＳ＃１、ＶＴＳ＃２から構成され、ＶＴＳ＃１は、ＶＴＳＩ１１と、ＶＯＢ１０とから構成される。

【０１３８】ＡＭＧ２０２は、ナビゲーション情報の実体部分であるＡＭＧＩ（AMG Information）２４０を含む。ＡＭＧＩ２４０は、ＡＭＧＩ２４０のファイルサイズや記録アドレスなどの情報を含むＡＭＧＩマネージメントテーブル２４１と、ＡＴＴサーチポインタテーブル２４２と、ＡＯＴＴサーチポインタテーブル２４３と、を含む。ここでＡＴＴとは、オーディオ情報のみから構成されるオーディオオンリータイトル（ＡＯＴＴ）、ＡＶ情報から構成される画像専用タイトル（ＡＶＴＴ）及びＡＶ情報から構成される画像音声両用タイトル（ＡＶＴＴ／ＡＯＴＴ）の総称である。

【０１３９】ここで、サーチポインタとは、各タイトルの再生制御情報（ここでは、ＡＰＧＣＩ、ＰＧＣＩのことを指す。）のＤＶＤ上の記録位置を示すポインタである。前述のように、各タイトルは、オーディオ情報、ＡＶ情報などの実体情報と、それらの実体情報を組み合わせて再生するための再生制御情報により構成される。この再生制御情報は、ＡＴＳ内のＡＴＳＩ又はＶＴＳ内のＶＴＳＩに記録されている。サーチポインタは、各タイトルの再生制御情報のＡＴＳＩ又はＶＴＳＩ内の記録位置を示すポインタである。なお、ナビゲーション情報は、各タイトルの再生を管理するための情報であり、本実施形態では上記サーチポインタを含む概念である。

【０１４０】ＡＴＴサーチポインタテーブル２４２は、当該オーディオ・ビデオ両用ＤＶＤの各タイトルをコンパチブルプレーヤで再生する場合のナビゲーション情報を記述したテーブルである。一方、ＡＯＴＴサーチポインタテーブル２４３は、当該オーディオ・ビデオ両用ＤＶＤの各タイトルをオーディオプレーヤで再生する場合のナビゲーション情報を記述したテーブルである。また、ＡＴＴサーチポインタテーブル２４２と、ＡＯＴＴサーチポインタテーブル２４３とは１：１対応しておりＡＴＴサーチポインタテーブル内に記述されるサーチポインタの数は当該オーディオ・ビデオ両用ＤＶＤに含まれる全てのタイトルの数と一致する。例えば、図６に示すように、当該オーディオ・ビデオ両用ＤＶＤに合計７個のタイトルが含まれていれば、ＡＴＴサーチポインタテーブル２４２内にはその７個のタイトルに対応するサーチポインタが記述され、そのタイトルの種類に関わらずＡＯＴＴサーチポインタテーブル２４３にも７個のサーチポインタを記述する枠が用意される。そしてそれぞれのテーブルの枠は１：１に対応している。

【０１４１】（4.3.1.1）ＡＴＴ＿ＳＲＰ

オーディオタイトルサーチポインタ（ＡＴＴ＿ＳＲＰ）は、オーディオ・ビデオ両用ＤＶＤをコンパチブルプレーヤで再生する際に使用するナビゲーション情報である。従って、オーディオ・ビデオ両用ＤＶＤがセットされると、コンパチブルプレーヤはこのＡＴＴ＿ＳＲＰを参照して各タイトルの再生を行う。

【０１４２】図８に示すナビゲーション情報の例は、図６に示すオーディオ・ビデオ両用ＤＶＤの例に対応するものであり、タイトル＃１、＃３が画像音声両用タイトル（ＡＶＴＴ／ＡＯＴＴ）、タイトル＃２、＃５がオーディオオンリータイトル（ＡＯＴＴ）、タイトル＃４、＃６、＃７が画像専用タイトル（ＡＶＴＴ）である。

【０１４３】既に述べたように、オーディオ・ビデオ両用ＤＶＤには３種類のタイトル（ＡＯＴＴ、ＡＶＴＴ／ＡＯＴＴ、ＡＶＴＴ）を記録することができる。よって、オーディオ・ビデオ両用ＤＶＤでは、ＡＭＧのＡＴＴサーチポインタテーブル２４２に、３種類全てのタイトル（ＡＯＴＴ、ＡＶＴＴ／ＡＯＴＴ、ＡＶＴＴ）に関するサーチポインタが記述される。

【０１４４】しかしながら、図８のＡＴＴサーチポインタテーブル２４２に実際に書かれるタイトルサーチポインタ２４５は、オーディオオンリータイトルサーチポインタ（ＡＯＴＴ＿ＳＲＰ）または画像専用タイトルサーチポインタ（ＡＶＴＴ＿ＳＲＰ）のみであり、画像音声両用タイトル（ＡＶＴＴ／ＡＯＴＴ）についてのタイトルサーチポインタは画像専用タイトルサーチポインタ（ＡＶＴＴ＿ＳＲＰ）として記述される（実際の記述を図８のテーブル中に括弧書きで示している）。これは、

コンパチブルプレーヤにとっては画像音声両用タイトル（ＡＶＴＴ／ＡＯＴＴ）と画像専用タイトル（ＡＶＴＴ）を区別する必要が無いからである。即ち、コンパチブルプレーヤは、ＤＶＤビデオフォーマットの再生能力を有しており、全ての画像音声両用タイトルをＡＶ情報として再生するので、ナビゲーション情報上もビデオサーチポインタ（ＡＶＴＴ＿ＳＲＰ）と区別する必要が無いからである。従って、画像の再生を伴うタイトルに関しては、全て画像専用タイトルサーチポインタ（ＡＶＴＴ＿ＳＲＰ）として共通の書式で記述される。

【０１４５】従って、図６の左列と図８のオーディオタイトルサーチポインタテーブル２４５とを対比すると分かるように、コンパチブルプレーヤ用のナビゲーション情報を記述するＡＴＴサーチポインタテーブル２４２では、画像専用タイトル（タイトル＃４、６、７）及び画像音声両用タイトル（タイトル＃１、３）については画像専用タイトルサーチポインタ（ＡＶＴＴ＿ＳＲＰ）が記述され、オーディオオンリータイトル（タイトル＃２、５）についてはＡＯＴＴサーチポインタ（ＡＯＴＴ＿ＳＲＰ）が記述される。コンパチブルプレーヤは、このテーブル２４２を参照し、図６の左列に示すように、タイトル＃１、３、４、６、７をＡＶ情報として再生し、タイトル＃２、＃５をオーディオ情報として再生する。

【０１４６】（4.3.1.2）ＡＯＴＴ＿ＳＲＰ

一方、ＡＯＴＴサーチポインタテーブル２４３には、オーディオプレーヤ用のナビゲーション情報が記述されている。よって、オーディオ・ビデオ両用ＤＶＤがセットされると、オーディオプレーヤはこのＡＯＴＴサーチポインタテーブル２４３を参照して再生を行う。

【０１４７】このテーブルには、オーディオタイトル（ＡＯＴＴ）及び画像音声両用タイトル（ＡＶＴＴ／ＡＯＴＴ）に関するサーチポインタが記述される。オーディオプレーヤはＡＶ情報の再生能力を有しないので、画像専用タイトル（ＡＶＴＴ）についてのサーチポインタの記述は必要が無い。しかし、このテーブルに実際に書かれるサーチポインタは、ＡＯＴＴサーチポインタ（ＡＯＴＴ＿ＳＲＰ）だけである。オーディオプレーヤにとっては、音声のみを再生できるタイトルであるか否かについての情報だけがあれば良く、オーディオタイトル（ＡＯＴＴ）と画像音声両用タイトル（ＡＶＴＴ／ＡＯＴＴ）を区別する必要が無い。従って、オーディオオンリータイトルサーチポインタテーブル（ＡＯＴＴ＿ＳＲＰＴ）２４３上では、オーディオタイトル（ＡＯＴＴ）と画像音声両用タイトル（ＡＶＴＴ／ＡＯＴＴ）を区別せず、全てＡＯＴＴサーチポインタ（ＡＯＴＴ＿ＳＲＰ）として共通な書式で記述される。

【０１４８】従って、画像音声両用タイトル（ＡＶＴＴ／ＡＯＴＴ）については、上記のＡＴＴサーチポインタテーブル２４２内では画像専用タイトルサーチポインタ（ＡＶＴＴ＿ＳＲＰ）が記述されるが、ＡＯＴＴサーチポインタテーブル２４３内ではオーディオオンリータイトルサーチポインタ（ＡＯＴＴ＿ＳＲＰ）が記述されることになる。

【０１４９】なお、画像専用タイトル（ＡＶＴＴ）については、タイトルサーチポインタを書く枠だけが用意されているものの、実体的な情報は記述されないか、若しくは、このタイトルはＡＯＴＴ＿ＳＲＰを持っていない（音声だけの再生はできない）旨が記述される。ＡＯＴＴサーチポインタテーブル２４３はオーディオプレーヤ用のナビゲーション情報を記述するものであり、オーディオプレーヤはＡＶ情報の再生は不能だからである。よって、オーディオプレーヤはこのタイトルを再生できないと判断し、この記述を無視する。

【０１５０】以上のように記述されたＡＯＴＴタイトルサーチポインタテーブル２４３を参照して、オーディオプレーヤは図６の右列に示す再生を行う。即ち、画像専用タイトル＃４、６、７を無視し、タイトル＃１、２、３、５についてオーディオ情報を再生する。

【０１５１】（4.3.2）ＶＭＧ、ＶＴＳＩ、タイトルサーチポインタ

ＶＭＧ３は、ナビゲーション情報の実体部分であるＶＭＧＩ（VMG Information）を含む。ＶＭＧＩは、ＶＭＧＩのファイルサイズや記録アドレスなどの情報を含むＶＭＧＩマネージメントテーブル２５０と、タイトルサーチポインタテーブル（ＴＴ＿ＳＲＰＴ）２５１とを含む。タイトルサーチポインタテーブル２５１は、ビデオプレーヤについてのナビゲーション情報を記述したテーブルである。よって、ビデオプレーヤは、このタイトルサーチポインタテーブル（ＴＴ＿ＳＲＰＴ）２５１を参照し、従来のビデオフォーマットで決められた手順に従ってタイトルの再生を行う。従って、ここでいうタイトルは、画像音声両用タイトル（ＡＶＴＴ／ＡＯＴＴ）と画像専用タイトル（ＡＶＴＴ）の２種類であるが、タイトルサーチポインタテーブル（ＴＴ＿ＳＲＰＴ）２５１には、この２つを区別することなく、全てＴＴ＿ＳＲＰとして記述されるということになる。

【０１５２】このように、オーディオ・ビデオ両用ＤＶＤでは、オーディオプレーヤ、ビデオプレーヤ、コンパチブルプレーヤそれぞれにとって、最適なナビゲーション情報を準備し、３つの別個のタイトルサーチポインタテーブルとして記録している。これにより、各再生装置の能力に応じて最適な再生が行うことができる。

【０１５３】（4.4）サーチポインタテーブルの構造

次にサーチポインタテーブルの構造についてさらに詳しく説明する。

【０１５４】（4.4.1）ＡＴＴ＿ＳＲＰ、ＡＯＴＴ＿ＳＲＰ、ＴＴ＿ＳＲＰ

ＡＴＴサーチポインタテーブル２４２は、ＡＴＴサーチポインタの数などの情報を含むＡＴＴサーチポインタ情

報２４４と、複数のＡＴＴサーチポインタ２４５とを含む。なお、図８において、各ＡＴＴサーチポインタの括弧内は、実際に当該サーチポインタとして記載されるサーチポインタの種類を示す。前述したようにＡＴＴサーチポインタテーブル２４２に書かれるサーチポインタは、ＡＯＴＴ＿ＳＲＰ又はＡＶＴＴ＿ＳＲＰのいずれかである。

【０１５５】ＡＯＴＴサーチポインタテーブル２４３は、同様にＡＯＴＴサーチポインタの数などの情報を含むＡＯＴＴサーチポインタ情報２４６と、複数のＡＯＴＴサーチポインタ２４７とを含む。図８において、各ＡＯＴＴサーチポインタの括孤内も、実際に当該サーチポインタとして記述されるサーチポインタの種類を示す。前述のように、ＡＯＴＴサーチポインタテーブルに書かれるサーチポインタは、全てＡＯＴＴ＿ＳＲＰである。

【０１５６】同一のタイトルを指定するＡＴＴサーチポインタとＡＯＴＴサーチポインタの各サーチポインタテーブル上における位置は、同じでなくてはならない。即ち、ＡＴＴサーチポインタテーブル２４２上のＡＴＴサーチポインタと、ＡＯＴＴサーチポインタテーブル２４３上のＡＯＴＴサーチポインタとは、１：１で対応しており、ＡＴＴ＿ＳＲＰ＃１とＡＯＴＴ＿ＳＲＰ＃１は同一のタイトルを指定する。

【０１５７】ＴＴサーチポインタテーブル２５１は、同様にＴＴサーチポインタの数などの情報を含むＴＴサーチポインタ情報２５２と、複数のＴＴサーチポインタ２５４とを含む。

【０１５８】ＡＴＴサーチポインタ２４５とＡＯＴＴサーチポインタ２４７とは１：１で対応しているが、両者とＴＴサーチポインタとの間には必ずしも１：１の対応関係は存在しない。しかし、ＴＴサーチポインタも、対象となるタイトルを論理的に構成するＰＧＣを示すことでその再生手順を示しているという点ではＡＴＴサーチポインター、ＡＯＴＴサーチポインターと同じである。

【０１５９】（4.5）各タイトルの再生方法

次に、図６及び８を参照し、オーディオ・ビデオ両用ＤＶＤに記録可能な３種類のタイトルの各々の再生方法について、それらタイトルを再生可能なプレーヤ毎に分類して説明する。

【０１６０】（4.5.1）オーディオオンリータイトル（ＡＯＴＴ）の再生方法

ＡＯＴＴを再生できるのは、オーディオプレーヤとコンパチブルプレーヤである。ＡＯＴＴは、オーディオ情報再生のためのタイトルである。また、本発明で実現しようとしている、もしくは関連のある、オーディオオンリータイトルの主な再生形態（機能）には、以下のものがある。但し画像音声両用タイトル（ＡＶＴＴ／ＡＯＴＴ）のオーディオプレーヤでの再生において、実現できる再生形態も含む。

【０１６１】マルチチャンネル再生：ＤＶＤオーディオフォーマットにおいて、ビデオゾーンのＬＰＣＭオーディオ情報は、最大８ｃｈ可能。ディスクリートマルチチャンネルとしては、最大６ｃｈ可能。この場合、各チャンネルに対して前方３チャンネル＋後方２チャンネル＋サブウーハの組み合わせのから１１パターンが、またディスクリートマルチチャンネルの部分と２ｃｈ再生用の信号との組み合わせから１３パターン計２４パターンの設定が可能。オーディオゾーンのＬＰＣＭオーディオ情報は、最大６チャンネル可能、各チャンネルに対して前方３チャンネル＋後方２チャンネル＋サブウーハの組み合わせの中で２１パターンが可能。

【０１６２】２ｃｈ再生：２ｃｈ以下のＬＰＣＭオーディオ情報は、そのまま再生。ビデオゾーンのマルチチャンネルＬＰＣＭオーディオ情報は、ＣＨ０，ＣＨ１の２ｃｈのみ再生、オーディオゾーンのマルチチャンネルＬＰＣＭオーディオ情報は、トラック単位で別々に定義されるダウンミックス係数に基づいて２ｃｈにダウンミックスし２ｃｈとして再生する。

【０１６３】オーディオセレクション：ＤＶＤでは、２つの異なった再生形態のオーディオ情報を一つのタイトルとして定義し、ユーザが選択することができる。この機能をオーディオセレクションと呼ぶ。具体的には、ユーザが同一の曲に対して２ｃｈとマルチチャンネルの異なった再生形態を選択することができる。また２ｃｈとマルチチャンネル以外の選択としては、同一の曲に対してＬＰＣＭ記録のオーディオ情報と他のコーディング方式（圧縮音声や１ビット音声など）で記録されたオーディオ情報とを選択し聞くこともできる。

【０１６４】オーディオコーディングモード（リニアＰＣＭ、ドルビーＡＣ３、ＭＰＥＧオーディオ、ＤＴＳ、ＳＤＤＳ）：オーディオ情報を記録する際の符号化方式の種類を示す。ＣＤにも使われているＬＰＣＭがよく知られている。他は圧縮符号化方式の一つである。

【０１６５】マルチチャンネルタイプ：ＤＶＤオーディオフォーマットにおける、ＬＰＣＭのマルチチャンネル記録の種類を示す。タイプ１の場合には、最大６ｃｈまで設定可能。各チャンネルにとスピーカ配置の関係も、前方３チャンネル＋後方２チャンネル＋サブウーハの組み合わせの中で設定可能。

【０１６６】チャンネルアサイメント（チャンネル数、スピーカ配置）：ＬＰＣＭのマルチチャンネルにおける、チャンネル数、各チャンネルと出力スピーカ配置との関係、及び各チャンネルとチャンネルグループとの関係を示す。例えば、３ｃｈの信号が記録されている場合、ＣＨ０は、Left Front speaker:左前から出力する信号でチャンネルグループ１に含まれる、ＣＨ１は、Right Front speaker:右前から出力する信号でチャンネルグループ１に含まれる、ＣＨ２は、Surround speaker:後方から出力する信号で、チャンネルグループ２に含まれる、といった関係であることを示す。前述したよう

に、マルチチャンネルタイプが、タイプ１の場合には、前方３チャンネル＋後方２チャンネル＋サブウーハの組み合わせの中で２１パターンの設定が可能で、チャンネルアサイメント情報がこの２１パターンのうちどの組み合わせであるかを示す。

【０１６７】マルチストリーム：ＤＶＤオーディオフォーマットにおけるオーディオ領域に記録されるオーディオの実体情報は、ＡＯＢの中に、唯一のオーディオストリームとして記録されるが、ビデオ領域に記録されるオーディオの実体情報は、ＶＯＢの中に、映像のストリームと共に、パック毎に多重して記録される。またＶＯＢは、限られた転送レートの範囲内であれば、複数のオーディオストリームを多重することができる。例えば２ｃｈ／ＬＰＣＭオーディオストリームとマルチチャンネル／ＬＰＣＭオーディオストリームを多重したり、２ｃｈ／ＬＰＣＭオーディオストリームとＡＣ－３圧縮音声ストリームを多重することも可能である。これらの再生形態の異なる２つのオーディオストリームは、オーディオセレクションの値を指定することにより、ユーザが選択することができる。

【０１６８】（4.5.1.1）オーディオプレーヤの場合

最初に、オーディオプレーヤがＡＯＴＴを再生する方法について説明する。前述のように、オーディオプレーヤはナビゲーション情報としてＡＯＴＴ＿ＳＲＰＴ２４３のみを参照する。従って、タイトル＃２を再生しようとすると、ＡＯＴＴ＿ＳＲＰ＃２を参照し、当該タイトルが含まれる、ＡＴＳ番号（この場合は、ＡＴＳ＃１）とそのＡＴＳ内でのタイトル番号を読み出す（図８、「Ｐ２Ａ（1）」で示すパスを参照）。次に該当するＡＴＳ＃１のＡＴＳＩ２１１を参照し（図８、「Ｐ２Ａ（2）」で示すパスを参照）、先のＡＴＳ内でのタイトル番号から当該タイトルが対応するＡ（Audio）ＰＧＣＩを読み出す。従って、再生時にはＡＯＴＴ＿ＳＲＰ＃２が指定するＡＰＧＣＩに従ってＡＯＢ２１０内のオーディオパック４３を再生することによりオーディオ情報を再生する（図８、「Ｐ２Ａ（3）」で示すパスを参照）。

【０１６９】（4.5.1.2）コンパチブルプレーヤの場合

次に、コンパチブルプレーヤがＡＯＴＴを再生する方法ついて説明する。コンパチブルプレーヤはナビゲーション情報としてＡＴＴ＿ＳＲＰＴ２４２を参照する。従って、タイトル＃２を再生しようとすると、ＡＴＴ＿ＳＲＰ＃２を参照し、それがＡＯＴＴ＿ＳＲＰであるので、当該タイトルがＡＯＴＴであることを認識する。以後、オーディオプレーヤと同様に、当該タイトルが含まれる、ＡＴＳ番号（この場合は、ＡＴＳ＃１）とそのＡＴＳ内でのタイトル番号を読み出す（図８、「Ｐ２Ｃ（1）」で示すパスを参照）。次に該当するＡＴＳ＃１のＡＴＳＩ２１１を参照し（図８、「Ｐ２Ｃ（2）」で示すパスを参照）、先のＡＴＳ内でのタイトル番号から当該タイトルが対応するＡＰＧＣＩを読み出す。従って、再生時にはＡＴＴ＿ＳＲＰ＃２が指定するＡＰＧＣＩに従ってＡＯＢ２１０内のオーディオパック４３を再生することによりオーディオ情報を再生することができる（図８、「Ｐ２Ｃ（3）」で示すパスを参照）。

【０１７０】（4.5.2）画像専用タイトル（ＡＶＴＴ）

次に、画像専用タイトルの再生のパスを説明する。画像専用タイトルは、ビデオプレーヤとコンパチブルプレーヤが再生することができる。

【０１７１】（4.5.2.1）ビデオプレーヤの場合

ビデオプレーヤは、ナビゲーション情報としてＴＴ＿ＳＲＰＴ（タイトルサーチポインタテーブル）２５１を参照し、ビデオフォーマットの再生手順に従って処理を行う。従って、まずＶＭＧ３のタイトルサーチポインタテーブル２５１を参照する。ここでオーディオナビゲーション上で対応するタイトルの各タイトルサーチポインタテーブル２４２、２４３上のサーチポインタの記述位置と、ＶＭＧ３のタイトルサーチポインタテーブル２５１上のタイトルサーチポインタの記述位置は、１：１に対応していなくてもよい。即ち、ＡＭＧＩのＡＴＴサーチポインタテーブル２４２とＶＭＧＩのＴＴサーチポインタテーブル２５１において、その内容及び順番を、独立に定義することができる。ただし、混乱を避けるため、タイトルサーチポインタテーブル２５１内に、ＶＭＧＩのＴＴ＿ＳＲＰ２５４に対応するタイトルがない場合には、原則としてＴＴサーチポインタテーブル上で枠を詰めて記述することとする。従ってタイトル番号は、図８で示すように異なる場合がある。即ち、図６に示す例のオーディオ・ビデオ両用ＤＶＤには７個のタイトルが存在するが、ビデオプレーヤはＡＯＴＴであるタイトル＃２及び＃５は再生しないので、これらを省いた残りの５個のタイトル（タイトル＃１、＃３、＃４、＃６、＃７）についてのＴＴ＿ＳＲＰをタイトルサーチポインタテーブル２５１内に記述している。よって、タイトルサーチポインタテーブル２５１内のＴＴ＿ＳＲＰ＃１－＃５は、夫々図６に示す各タイトル＃１、＃３、＃４、＃６、＃７に対応している。

【０１７２】ＴＴ＿ＳＲＰ２５４は、対象となるタイトルを論理的に構成するＰＧＣを示している。従ってビデオプレーヤは、このサーチポインタから当該タイトルが含まれるＶＴＳ番号（この場合は、ＶＴＳ＃１）とそのＶＴＳ内でのタイトル番号を読み出す（図８、「Ｐ３Ｖ（1）」で示すパスを参照）。次に該当するＶＴＳ＃１のＶＴＳＩ１１を参照し（図８、「Ｐ３Ｖ（2）」で示すパスを参照）、先のＶＴＳ内でのタイトル番号から当該タイトルが対応するＰＧＣＩを読み出す。よって、ビデオプレーヤは、このＰＧＣＩを取得し、ＶＯＢ内のビデオパック、オーディオパックなどを使用して当該タイトルをＡＶ情報として再生する（図８、「Ｐ３Ｖ（3）」で示すパスを参照）。

【０１７３】（4.5.2.2）コンパチブルプレーヤの場合
次に、コンパチブルプレーヤが画像専用タイトル（ＡＶＴＴ）を再生する場合のパスについて説明する。コンパチブルプレーヤはナビゲーション情報としてＡＴＴ＿ＳＲＰＴ２４２のみを参照する。従って、このＡＴＴ＿ＳＲＰ＃４を参照し、それがＡＶＴＴ＿ＳＲＰであるので、当該タイトルが画像専用タイトルであることを認識する。前述したように、ビデオプレーヤにおけるタイトル番号とは一致しない。しかし以後は、ビデオプレーヤがＴＴ＿ＳＲＰＴから読み出したのと同様に、ＡＴＴ＿ＳＲＰ２４５から、当該タイトルが含まれる、ＶＴＳ番号（この場合は、ＶＴＳ＃１）とそのＶＴＳ内でのタイトル番号を読み出す（図８、「Ｐ４Ｃ（1）」で示すパスを参照）。次に該当するＶＴＳ＃１のＶＴＳＩ１１を参照し（図８、「Ｐ４Ｃ（2）」で示すパスを参照）、先のＶＴＳ内でのタイトル番号から当該タイトルが対応するＰＧＣＩを読み出す。よって、コンパチブルプレーヤも、このＰＧＣＩを取得し、ＶＯＢ内のビデオパック、オーディオパックなどを使用して当該タイトルをＡＶ情報として再生する（図８、「Ｐ４Ｃ（3）」で示すパスを参照）。

【０１７４】（4.5.2.3）オーディオプレーヤの場合
次に、オーディオプレーヤの場合について説明する。オーディオプレーヤはナビゲーション情報としてＡＯＴＴ＿ＳＲＰＴ２４３のみを参照する。従ってＡＯＴＴ＿ＳＰＲ＃４を読み出すが、ここには該当するＡＯＴＴは無いと書かれているため、再生を中止する。

【０１７５】（4.5.3）画像音声両用タイトル（ＡＶＴＴ／ＡＯＴＴ）の場合
画像音声両用タイトルは、オーディオプレーヤ、ビデオプレーヤ、コンパチブルプレーヤ全てのプレーヤで再生される。従ってこの順に説明する。

【０１７６】（4.5.3.1）オーディオプレーヤの場合
最初に、オーディオプレーヤが画像音声両用タイトルを再生する方法について説明する。オーディオプレーヤはナビゲーション情報としてＡＯＴＴ＿ＳＲＰＴ２４３しか参照しない。従って、ＡＯＴＴ＿ＳＲＰ＃１を参照し、当該タイトルが含まれるＡＴＳ番号（この場合は、ＡＴＳ＃３）とそのＡＴＳ内でのタイトル番号を読み出す（図８、「Ｐ１Ａ（1）」で示すパスを参照）。次に該当するＡＴＳ＃３のＡＴＳＩ２１２を参照し（図８、「Ｐ１Ａ（2）」で示すパスを参照）、先のＡＴＳ内でのタイトル番号から当該タイトルが対応するＡＰＧＣＩを読み出す。但し、このＡＴＳ＃３は、実体としてのオーディオデータを含まず、このＡＰＧＣＩはＶＴＳ＃１のＶＯＢ１０に対する再生手順を示すものである。従って、再生時にはこのＡＰＧＣＩに従ってＶＯＢ１０内のオーディオパック４３だけを再生することによりオーディオ情報のみを再生する（図８「Ｐ１Ａ（3）」で示すパスを参照）。

【０１７７】（4.5.3.2）ビデオプレーヤの場合
次にビデオプレーヤが画像音声両用タイトル再生する方法について説明する。前述したように、ビデオプレーヤは、ディスクの種類に関わらず、ビデオフォーマットの再生手順に従って処理を行う。従って、まず最初にＶＭＧ３のタイトルサーチポインタテーブル２５１を参照する。ここでのタイトル番号は＃１であり、オーディオナビゲーション上のタイトル番号と一致する。以後のパスは、（5.2.1）の場合と同様であるので説明を省略する。（図８、「Ｐ１Ｖ（1）、（2）、（3）」で示すパスを参照）

（4.5.3.3）コンパチブルプレーヤの場合
次に、コンパチブルプレーヤが画像音声両用タイトルを再生する方法について説明する。コンパチブルプレーヤはナビゲーション情報としてＡＴＴ＿ＳＲＰＴ２４２のみを参照する。従って、このＡＴＴ＿ＳＲＰ＃１を参照し、ＡＶＴＴであることを認識する。以後は、ビデオプレーヤがＴＴ＿ＳＲＰＴ２５１から読み出したのと同様に、ＡＴＴ＿ＳＲＰ２４５から、当該タイトルが含まれるＶＴＳ番号（この場合も、ＶＴＳ＃１）とそのＶＴＳ内でのタイトル番号を読み出す（図８、「ＰＩＣ（1）」で示すパスを参照）。以後のパスは、ビデオプレーヤの場合と同様であるので説明を省略する（図８、「ＰＩＣ（2）、ＰＩＣ（3）で示すパスを参照）。

【０１７８】以上説明したように、ビデオ用のナビゲーション情報とオーディオ用のナビゲーション情報を持つだけでなく、それらを統合する情報を持ち、又はそれらを関連づける情報を持つことで、各種再生形態が異なるタイトルを、再生能力が異なる各種プレーヤで再生した際の矛盾と混乱をなくすことができる。

【０１７９】（５）タイトルの管理情報
今まで述べてきたようにユーザは、所望のタイトルグループ又はそこに含まれるトラックを選択し、再生を指示する。再生装置は、指示されたタイトルグループを構成する、タイトル又は指示されたトラックが含まれるタイトルを、再生装置の能力に応じて自動的に選択し再生を開始する。

【０１８０】さらに、ＤＶＤオーディオフォーマットでは、オーディオタイトル（ＡＯＴＴ）又は画像音声両用タイトル（ＡＶＴＴ／ＡＯＴＴ）をオーディオプレーヤで再生する場合、オーディオ情報を選択することができる論理構造となっている。この機能を実現するための構造について、最初にそのナビゲーション情報を図９に基づいて説明する。図９は、図３又は図８に示したＡＴＳ２０３の構造を詳細に示したブロック図である。

【０１８１】（5.1）ＡＴＳＩ
ＡＴＳ２０３は、前述したようにナビゲーション情報としてのＡＴＳＩ２１１とオーディオ実体情報（ＡＯＴＴ＿ＡＯＢ２１０）の纏まりとしてのＡＯＴＴ＿ＡＯＢＳ１０’及びＡＴＳＩ２１１のバックアップとしてのＡＴ

ＳＩ＿ＢＵＰ２１３から構成されている。

【０１８２】また、ＡＴＳＩ２１１は図９に示すように、管理情報としてのＡＴＳＩ＿ＭＡＴ２７０と再生制御情報のテーブルであるＡＴＳ＿ＰＧＣＩＴ２７１から構成されている。

【０１８３】（5.1.1）ＡＴＳＩ＿ＭＡＴ

管理情報のＡＴＳＩ＿ＭＡＴ２７０には、各種テーブルのアドレス情報やオーディオ実体情報に関する属性情報やダウンミックス係数等が記述される。

【０１８４】（5.1.1）属性情報

属性情報には、ＡＯＴＴ＿ＡＯＢＳ２１０’に含まれるＡＯＴＴ＿ＡＯＢ２１０に関して、各ＡＯＴＴ＿ＡＯＢ２１０毎に、その符号化方式、標本化周波数、量子化ビット数、チャンネル数、マルチチャンネルタイプ、チャンネルアサイメント等が、記述される。このようにＡＴＳ２０３に、ＡＯＴＴ＿ＡＯＢＳ２１０’が在る場合には、複数種類のオーディオ情報は、別のＡＯＴＴ＿ＡＯＢ２１０としてＡＯＴＴ＿ＡＯＢＳ２１０’の中に個々に分かれて記録されることとなる。また、ＡＴＳ２０３には、ＡＯＴＴ＿ＡＯＢＳ２１０’を持たないものもあり、この場合の属性情報には、ビデオゾーンに記録されたＶＯＢ（ＡＯＴＴ＿ＶＯＢ，　ＡＶＴＴ＿ＶＯＢ）１０のオーディオストリームに関する属性情報が、記述される。従ってＶＯＢ１０に複数種類のオーディオ情報が、複数のストリームとしてＶＯＢに記録されている場合、各ストリーム毎にそのストリーム番号とその属性情報がここに記述される。

【０１８５】（5.1.2）ＡＴＳ＿ＰＧＣＩＴ

ＡＴＳ＿ＰＧＣＩＴ２７１は、再生制御テーブル全体に関する情報を記述する、ＡＴＳ＿ＰＧＣＩＴＩ２７２とタイトルに対応する再生制御情報を探すためのサーチポインタ（ＡＴＳ＿ＰＧＣＩ＿ＳＲＰ）２７５のテーブル２７５と再生制御情報（ＡＴＳ＿ＰＧＣＩ）２７６そのもののテーブル２７４から構成される。

【０１８６】（5.1.2.1）ＡＴＳ＿ＰＧＣＩ＿ＳＲＰ

本発明では、種類の異なる複数のオーディオ情報をディスクに記録すると共に、原則として録音対象が共通なオーディオ情報については、同じ作品、同じ曲として取り扱うために、図１０及び図１１に示すように、管理情報としてのＰＧＣ３００を導入し、一つのタイトル２６１に種類の異なる複数のオーディオ情報を関係付けている。このＰＧＣ３００を用いたオーディオ情報の管理方法の詳細については後述するが、本発明においては、一つのタイトル２６１に種類の異なる複数のオーディオ情報を関係付ける場合には、ＰＧＣ３００をブロック化した論理構造を有している。

【０１８７】そして、このＰＧＣ３００により管理されるオーディオ実体情報の再生制御情報がＡＴＳ＿ＰＧＣＩ２７６であり、ＡＴＳ＿ＰＧＣＩ＿ＳＲＰ２７５には、各タイトル６２１に対応するＡＴＳ＿ＰＧＣＩ２７６を探すための情報が記述される。例えば、各ＡＴＳ＿ＰＧＣＩ２７６毎にそのＰＧＣ３００がエントリーであるかどうかが記述される。エントリーとは、ＰＧＣブロックを代表するＰＧＣ３００であることを示す情報である。また、ＡＴＳ＿ＰＧＣＩ＿ＳＲＰ２７５には、ＡＴＳ２０３内のタイトル番号、ＰＧＣブロックを形成しているかどうか、またＰＧＣブロックの中での関係（先頭、ブロック中、最後）、ブロックタイプ、チャンネル数、符号化方式、ＡＴＳ＿ＰＧＣＩ２７６の開始アドレス等が記述される。

【０１８８】前述したように、タイトル再生開始時には、ＡＭＧ２０２のＡＯＴＴ＿ＳＲＰ２４７でＡＴＳ番号とＡＴＳタイトル番号をもって、対応するＡＴＳ＿ＰＧＣＩ２７６を取得すると説明してきたが、対応する番号のＡＴＳ２０３の、ＡＴＳ＿ＰＧＣＩ＿ＳＲＰ２７５を見ると、ＡＴＳタイトル番号に対応するＡＴＳ＿ＰＧＣＩ２７６の記録されている場所がわかる。

【０１８９】また、複数のオーディオ情報が一つのタイトルに対応している場合には、同じＡＴＳタイトル番号を持ったＡＴＳ＿ＰＧＣＩ＿ＳＲＰ２７５が複数存在することとなる。この場合には、他の情報（ブロックタイプ、チャンネル数、符号化方式）とあわせ判断し最適な、ＰＧＣ３００を選択し、再生を開始することとなる。

【０１９０】1.2.2）ＡＴＳ＿ＰＧＣＩ

サーチポインターのテーブルに続いて、各タイトルに対応した再生制御情報としてのＡＴＳ＿ＰＧＣＩ２７６が並び、テーブルを構成している。

【０１９１】本発明では、ＰＧＣ３００によりオーディオ実体情報を管理するために、図１０又は図１１に示すように、プログラム３０１という区分情報を用いている。プログラム３０１は、前述したセル２２０を、一曲等の再生単位で区分する情報であり、トラック２６０に対応した情報である。従って、タイトル２６１に対応するＰＧＣ３００は、一又は複数のプログラム３０１を管理することになり、この情報がＡＴＳ＿ＰＧＣＩ２７６に記述される。

【０１９２】一つのＡＴＳ＿ＰＧＣＩ２７６は、ＰＧＣ３００全体に関する情報（ＡＴＳ＿ＰＧＣ＿ＧＩ）２９０と、そのＰＧＣ３００を構成する各プログラム３０１に関する情報を集めたテーブルＡＴＳ＿ＰＧＩＴ２９１、さらにプログラム３０１を構成する各セル２２０に関する情報を集めたテーブルＡＴＳ＿Ｃ＿ＰＢＩＴ２９２から構成される。

【０１９３】（5.1.2.2.1）ＡＴＳ＿ＰＧＣ＿ＧＩ

ＡＴＳ＿ＰＧＣ＿ＧＩ２９０には、当ＰＧＣ３００全体に関する情報として、プログラム数、セル数、ＰＧＣ再生時間、この情報の後に続く各テーブルのスタートアドレス等、が記述されている。

【０１９４】（5.1.2.2.2）ＡＴＳ＿ＰＧＩＴ

ＡＴＳ＿ＰＧＣ＿ＧＩ２９０に続いて、当ＰＧＣ３００を構成するプログラム３０１に関する情報ＡＴＳ＿ＰＧＩが、その再生順にプログラム数だけ並び、テーブルＡＴＳ＿ＰＧＩＴ２９１を形成している。一つのＡＴＳ＿ＰＧＩには、連続再生のための情報、当プログラムが再生するオーディオ実体情報（ＡＯＢ）の属性を特定するための情報、ダウンミックス係数を特定するための情報、プログラム先頭に対応するセル番号、スタートＰＴＳ、プログラム再生時間、等の情報が記述される。

【０１９５】このＡＴＳ＿ＰＧＩの属性を特定する情報とは、前述した、ＡＴＳＩ＿ＭＡＴ２７０中に具体的に書かれているオーディオ実体情報の属性情報を属性番号ということで特定し、両者を対応させることで初めて当プログラムの詳細な属性情報を得ることができる。この属性番号をプログラム毎に定義できる構造としているため、ＤＶＤオーディオフォーマットでは、曲毎に属性が変更できる構造となっている。

【０１９６】しかし、ＡＴＳ＿ＰＧＣＩ＿ＳＲＰ２７５の中でも属性に関する情報がある。ＡＴＳ＿ＰＧＣＩ＿ＳＲＰ２７５に記述される属性情報は、種類の異なるオーディオ実体情報を選択するための情報であり、各プログラム３０１に共通な属性情報のみの記述となる。逆にいえば、プログラム単位で属性を自由に設定することができるといっても、符号化方式は共通でなければならない。またＰＧＣブロックを組んだ場合は、ＰＧＣ３００内の全てのプログラム３０１はチャンネル数も２ｃｈ以下で統一する又は３ｃｈ以上で統一する、という制限を守る必要がある。

【０１９７】また、プログラム先頭に対応するセル番号により、当プログラム３０１がどのセル２２０と対応しているかがわかる。

【０１９８】（5.1.2.2.3）ＡＴＳ＿Ｃ＿ＰＢＩＴ

ＡＴＳ＿ＰＧＩＴ２９１に続いて、当ＰＧＣ３００を構成するセルに関する情報ＡＴＳ＿Ｃ＿ＰＢＩが、その再生順にセル数だけ並びテーブルＡＴＳ＿Ｃ＿ＰＢＩＴ２９２を形成している。一つのＡＴＳ＿Ｃ＿ＰＢＩは、インデックス番号、セルタイプ、スタートアドレス、エンドアドレス等が記録される。ここで初めてタイトル２６１に対応するオーディオ実体情報のディスク上のアドレスがわかる。

【０１９９】例えば、ユーザがあるタイトルグループ２６２の３曲目を指示したとする。このタイトルグループ２６２は１つのタイトル２６１から構成されているとする。タイトル２６１に対応するＡＴＳ＿ＰＧＣＩの取得は前述したとおりである。３曲目なのでプログラム＃３に対応する３番目のＡＴＳ＿ＰＧＩＴ２９１を読み、その中の先頭セル番号＃ｎを取得する。プログラム３０１（＃３）はセル２２０（＃ｎ）から開始することがわかったので、ｎ番目のＡＴＳ＿Ｃ＿ＰＢＩを読みとり、ここに記述されている、スタートアドレスを取得し、そこへジャンプし３曲目の再生を開始することとなる。

【０２００】（5.2）オーディオ情報の記録方法

次に、本実施形態において、複数の種類の異なるオーディオ情報がどのように記録されるかについて説明する。

【０２０１】各オーディオディスクの物理構造の説明で述べたように、ＡＴＳ２０３，ＶＴＳ３には、それぞれ、オーディオ実体情報としてのＡＯＢ２１０、ＡＶ実体情報としてのＶＯＢ１０が含まれる。さらにオーディオタイトルとして再生される実体情報をそれぞれ、ＡＯＴＴ＿ＡＯＢ，ＡＯＴＴ＿ＶＯＢとも呼ぶ。複数のＡＯＴＴ＿ＡＯＢ，ＡＯＴＴ＿ＶＯＢを一つの纏まりとしたものが、それぞれＡＯＴＴ＿ＡＯＢＳ，ＡＯＴＴ＿ＶＯＢＳである。

【０２０２】複数の種類の異なるオーディオ情報とは、具体的に以下に示す３種類に分類される。

【０２０３】ａ．録音状況が異なる複数のオーディオ情報（たとえば、通常録音とバイノーラル録音、ホール前方での録音とＳ席での録音、ワンポイント録音とマルチマイクによる録音、等々）

ｂ．符号化方式が異なる複数のオーディオ情報（たとえば、ＬＰＣＭとＭＰＥＧ，Dolby AC-3，ＳＤＤＳ，ＤＴＳ、等々）

ｃ．再生形態（チャンネル数が２ｃｈ以下又は３ｃｈ以上）が、異なる複数のオーディオ情報

録音状況、符号化方式、再生形態、は、それぞれ独立に決めることができる。しかしここで対象とする、種類の異なる複数のオーディオ情報とは、原則として録音対象が共通なオーディオ情報であり、同じ作品（タイトル）、同じ曲（トラック）として扱われるべきものである。これらの種類の異なる複数のオーディオ情報は、ディスク上に２種類の異なった方法で記録される。

【０２０４】（5.2.1）複数のオーディオストリームを有したＡＯＴＴ＿ＶＯＢＳ

ＤＶＤオーディオフォーマットであっても、画像情報の伴った場合のオーディオ情報の記録方式は、ＤＶＤビデオフォーマットと互換を取るためＤＶＤビデオフォーマットと同じ記録方式とした。そこで、画像情報と共に種類の異なる複数のオーディオ情報を記録する場合には、同一の実体情報（ＡＯＴＴ＿ＶＯＢ）に、別ストリームとして、多重し、記録することとした。ビデオフォーマットのところでも述べたように、ＶＯＢ１０には、画像情報やオーディオ情報を始め副映像情報等がそれぞれ別なストリームとして定義され、それぞれパック単位（２０４８Ｂｙｔｅｓ）に分割され、この単位で多重され一つのシステムストリームとして、ディスク上に記録される。

【０２０５】ここでオーディオ情報としては、最大８種類まで定義できるので、種類の異なるオーディオ情報をそれぞれ、異なったストリーム番号を持つ別ストリームとして記録することができる。このような記録法方を取

った場合には、ＤＶＤビデオフォーマットと互換を取ることができる。また、再生装置が再生時に処理するストリームを変更するだけで簡単にオーディオ情報の種類を変更することができる、といったメリットがある。さらに、ビデオタイトルとして見た場合、一つの実体情報に記録しているので、当然、同一タイトル、同一トラックとして扱うことができる。従って、チャンネル数等の異なる複数のオーディオ情報を、ユーザへ混乱を与えることなく、適切に記録できる。

＊【０２０６】但し、このようなストリームの多重方式は、オーディオフォーマットに対しては不適切である。ＤＶＤディスクにおいては、全てのストリームのデータ転送レートの合計が１０．０８Ｍｂｐｓ以下でなくてはならないという制限がある。従って、以下の表１に示すような二つのストリームを多重することができない。

【０２０７】

【表１】

	Audio coding mode	fs	Qb	Number of Channel	Bit rate
Stream #1	LPCM	96k	24bit	2ch	4.608 Mbps
Stream #2	LPCM	48k	16bit	8ch	6.144 Mbps
Total					10.742 Mbps

【０２０８】オーディオＤＶＤでは、非圧縮のＬＰＣＭ音声を必ず記録する必要があるので、標本化周波数が高い場合、もしくはチャンネル数が多い場合、必要とされるデータ転送レートが高い。従ってオーディオ情報を主体とし、主に非圧縮のＬＰＣＭ音声を複数記録しようとする場合には、このストリームの多重方式は、不適当といえる。

【０２０９】また、オーディオフォーマットには、録音用としての機能や、現在使用されているスタジオ機器との整合性を重視し、特に記録時の処理が簡単なことが求められている。ＤＶＤビデオフォーマットのようにビデオストリームを始めとし、複数の可変レートのストリームを多重する構造を持つことになると、データ中に管理情報を置かなくてはならない。また、この管理情報には、前後数分のデータに関するアドレス情報を記述する構造となっており、録音装置として考えると、前後の数分のデータがそろわないとディスクに記録することができない。従って簡易な録音機を構成できないといった問題を生じる。また、現在のスタジオ機器以外に、新たなオーサリング装置が必要となる。といった問題もある。

【０２１０】（5.2.2）複数のブロックＡＯＴＴ＿ＡＯＢＳ

オーディオ情報だけを記録する場合は、上記の問題点を解決することを、より重要な課題とし、オーディオフォーマットとして求められる構造を採ることとした。そこで、一つの実体情報（ＡＯＴＴ＿ＡＯＢ）には、１種類のオーディオストリームしか記録しないこととし、種類の異なる複数のオーディオ情報を記録する場合には、別の実体情報（ＡＯＴＴ＿ＡＯＢ）としてディスク上別のエリアに分離して記録することとした。このようにすることで、一つのオーディオ情報のデータ転送レートが、１０．０８Ｍｂｐｓ以下であれば、いくつでも記録できる構造となる。また１種類のオーディオストリームしか記録しないため、そのオーディオ情報が非圧縮のＬＰＣＭのように固定レートのデータで在れば、データ中に管理情報を置く必要もなく、記録時の処理も簡単なものとなる。

【０２１１】また２ｃｈのオーディオ情報とマルチチャンネルのオーディオ情報とを同時に再生する必要はなく、また瞬時に切り換える必要性もあまりない。従って別の実体情報に分離して記録した場合には、再生時の切り換えに伴う処理が、複雑なものになるが、大きな問題ではないといえる。

【０２１２】しかし、この場合、複数の実体情報を、同一のタイトルとして扱う仕組みが必要となる。また同じ仕組みで、ＡＯＴＴ＿ＶＯＢに複数のストリームとして記録されたオーディオ情報も統一的に扱う必要がある。

【０２１３】（5.3）オーディオセレクション

以上のように、種類の異なる複数のオーディオ情報を記録する方法には、大きく分けて２つの方法があるが、夫々において問題がある。そこで、本発明は、再生制御情報に次のような論理構造を持たせることにより、夫々の方法における問題を解決し、適切なオーディオセレクションを可能にした。ここで、オーディオセレクションとは、同一タイトルとして扱う必要がある、ディスク上の異なるエリアに記録されている種類の異なる複数のオーディオ情報を切り換えることという。

【０２１４】まず、種類の異なる複数のオーディオ情報を、別の実体情報（ＡＯＴＴ＿ＡＯＢ）としてディスク上別のエリアに分離して記録する方法を採る場合には、図１０に示すように、オーディオ実体情報の記録方式（図１０の場合には、録音形態：２ｃｈとマルチｃｈ）

の異なる複数の各オーディオ実体情報（この場合はオーディオタイトルであるので、ＡＯＴＴ＿ＡＯＢ２１０（ＡＯＢ＃１，ＡＯＢ＃２））の再生に対して、夫々のＡＯＢ２１０を構成するセル２２０を、第２区分単位としてのプラグラム３０１の単位に区分する。また、夫々のプログラム３０１を、第２区分情報としてのプログラム番号（＃１，＃２，＃３，…）により識別する。このプログラム３０１とは、トラック２６０に対応した再生単位であり、例えば１曲分に相当する。従って、夫々のオーディオ実体情報（ＡＯＴＴ＿ＡＯＢ２１０（ＡＯＢ＃１，ＡＯＢ＃２））は、記録方式が異なるものの、内容は同一であるから、夫々のオーディオ実体情報についてのプログラム３０１の数及び順序は等しくなる。図１０の場合は、夫々、プログラム＃１，＃２，＃３で構成されることになる。

【０２１５】次に、夫々のプログラム３０１（プログラム＃１，＃２，＃３）を、管理情報としてのブロック化された夫々別のＰＧＣ３００（ＰＧＣ＃１，ＰＧＣ＃２）によりまとめる。そして、これらのＰＧＣ３００（ＰＧＣ＃１，ＰＧＣ＃２）を、同一のトラック２６１（図１０の場合はトラック＃１）に対応させることにより、同一のトラック２６０（＃１）に対して、夫々の記録方式の異なるオーディオ実体情報を含むプログラム３０１（プログラム＃１，＃２，＃３）を関係付けている。つまり、本発明は、第２区分情報としてのプログラム番号により識別されるプログラム単位のオーディオ実体情報であって、夫々記録方式の異なるオーディオ実体情報を、第１区分情報としてのトラック番号（＃１，＃２，＃３，…）により識別される第１区分単位としてのトラック２６１であって、同一のトラック番号を有する同一のトラック２６１に、管理情報としてのブロック化された別々のＰＧＣ３００を用いて関係付けている。

【０２１６】このようにすることにより、種類の異なる複数のオーディオ情報を、別の実体情報（ＡＯＴＴ＿ＡＯＢ）としてディスク上別のエリアに分離して記録する方法を採る場合でも、ユーザからは、同一のタイトル、同一の曲と認識され、ユーザの指示又は再生装置の能力にあった記録方式のオーディオ実体情報を管理するＰＧＣ３００を選択することで、種類の異なる複数のオーディオ実体情報を統一的に扱うことができる。

【０２１７】次に、ビデオフォーマットの記録領域に、ストリーム多重方式により記録方式の異なるオーディオ実体情報を記録する方法を採る場合には、図１１に示すように、 オーディオ実体情報ＡＯＴＴ＿ＶＯＢ１０（図１１の場合はＶＯＢ＃１）を、ブロック化され、かつ夫々の記録方式（図１１の場合には録音形態：２ｃｈとマルチｃｈ）ごとに設けられた別々のＰＧＣ３００（図１１の場合はＰＧＣ＃１，＃２）を用いて、同一のトラック２６１（図１１の場合はトラック＃１）に関係つける。なお、夫々のＰＧＣ３００が、プログラム３０１（図１１の場合はプログラム＃１，＃２，＃３）を管理する点は、図１０の場合と同様である。

【０２１８】このような論理構造を採ることにより、夫々のＰＧＣ３００により、夫々のオーディオ実体情報の記録方式が管理されているので、オーディオストリーム内のナビゲーション情報を直接参照することなく、ＰＧＣ３００を記録方式に応じて選択するだけで、所望の記録方式のオーディオ情報を適切に再生することができる。つまり、本発明によれば、ビデオフォーマットで記録されたオーディオ情報を、オーディオフォーマットの制御情報で管理することができる。勿論、この場合でも、ユーザからは、同一のタイトル、同一の曲と認識される。従って、ユーザの指示又は再生装置の能力にあったＰＧＣを選択することで、種類の異なる複数のオーディオ情報を統一的に扱うことができる。

【０２１９】以上のように、本発明によれば、オーディオ情報が、ＡＯＴＴ＿ＡＯＢに記録されている場合（オーディオタイトルを再生する場合）でも、ＡＯＴＴ＿ＶＯＢに記録されている場合（画像音声両用タイトルを再生する場合）でも、同じ仕組みでオーディオセレクションを行うことができ、本発明は、オーディオタイトル（ＡＯＴＴ）又は、画像音声両用タイトル（ＡＶＴＴ／ＡＯＴＴ）をオーディオプレーヤで再生する場合に有効である。

【０２２０】さらに図１２，１３を用いて具体的な例で、このオーディオセレクションがどのように行われるかを説明する。

【０２２１】（5.3.1）オーディオタイトルにおけるオーディオセレクション

最初に、オーディオタイトルをオーディオプレーヤ又はコンパチプレーヤで再生する場合を説明する。ここで、全てのタイトルグループは、１つのタイトルで構成されているものとする。再生装置が２ｃｈ専用であるか、ユーザが２ｃｈ再生を選択するように設定しているとする。また、ユーザがタイトルグループ２６２（＃ｊ）の再生を指示したとする。

【０２２２】前述したように、タイトルグループ２６２に対応するタイトルのＡＴＳ番号とＡＴＳタイトル番号がＡＯＴＴ＿ＳＲＰ２４７を参照し取得する（図８参照）。その結果ＡＴＳ番号は＃２、ＡＴＳタイトル番号は＃３だったとする。ここまでの流れは（4.5.1.1）オーディオプレーヤの場合、及び（4.5.1.2）コンパチブルプレーヤの場合、で説明したとおりである。

【０２２３】次にＡＴＳ＃２のＡＴＳＩ２１１を読みとり、ＡＴＳＩ＿ＭＡＴ２７０に書かれている属性情報を記憶する（図１２、「Ｐ１２（１）」で示すパスを参照）。この段階では、再生しようとしているタイトルの各トラックの属性を特定することはできない。とりあえず全ての属性情報を記憶しておく。

【０２２４】続いてＡＴＳ＿ＰＧＣＩＴ２７１を読み、

この中のＰＧＣＩサーチポインター（ＡＴＳ＿ＰＧＣＩ＿ＳＲＰ）２７３を読みにいく（図１２、「Ｐ１２（２）」で示すパスを参照）。このテーブルの中でＡＴＳタイトル番号（ＡＴＳ＿ＴＴＮ）が＃３のＡＴＳ＿ＰＧＣＩ＿ＳＲＰ２７３を探す。この場合、第１区分情報としてのＡＴＳタイトル番号が＃３のＡＴＳ＿ＰＧＣＩ＿ＳＲＰ２７３が二つあり（＃３と＃４）、ＰＧＣブロックを構成していることがわかる。そこで、どちらのＰＧＣ３００を選択するかを判断する。この場合、再生装置が２ｃｈ専用であるか、又はユーザが２ｃｈ再生を選択するように設定されているので、ブックタイプの項目を見る。ここに、チャンネル数の違いによりＰＧＣブロックを組んでいる書かれているので、次にＡｕｄｉｏ ｃｈａｎｎｅｌｓの項目２８４（図９及び図１２参照）をみて２ｃｈ以下と書かれている方のＰＧＣ３００を選択する。そして選択したＰＧＣ３００の再生制御情報ＡＴＳ＿ＰＧＣＩ２７６の書かれているアドレス（この場合は１６３８４）を取得し、そこへジャンプし、再生制御情報を読みとり、記憶する（図１２、「Ｐ１２（３）」で示すパスを参照）。

【０２２５】再生制御情報の中には、トラック２６０に対応する、プログラム３０１に関する情報テーブルと、セル２２０に関する情報テーブルとがある。タイトル先頭から再生を開始する場合には、プログラム＃１のＡＴＳ＿ＰＧＩを見て、プログラム＃１の属性を特定する情報と先に記憶した属性情報を使い、プログラム＃１の属性を特定する。この属性に従ってオーディオデコーダをセットする。次にＡＴＳ＿ＰＧＩから、プログラム＃１の先頭セル番号を読み（この場合、再生しようとしているのがプログラム＃１なので、当然その先頭セル番号も＃１である。）、その番号に対応するＡＴＳ＿Ｃ＿ＰＢＩからセル２２０の記録されているアドレスを読みとり、そこへジャンプし再生を開始する（図１２、「Ｐ１２（４）」で示すパスを参照）。

【０２２６】通常再生の場合は、次のプログラムになるまで、再生中のメモリーに記憶されているＡＴＳ＿Ｃ＿ＰＢＩを使ってセルの再生を続ける。プログラムの再生が終わったら、これもメモリー中のＡＴＳ＿ＰＧＩと属性情報を使って、次のプログラム再生のための一連の処理を行い再生を開始する。この動作をタイトル終了まで繰り返す。従って前述したように、管理情報内の全ての属性情報と再生制御情報ＡＴＳ＿ＰＧＣＩを記憶していなければならない。

【０２２７】次に、再生装置がマルチチャンネル再生に対応していて、なおかつユーザがマルチチャンネル再生を選択するように設定しているとする。また、ユーザがタイトルグループ２６２（＃ｊ）の再生を指示したとする。

【０２２８】タイトルグループ２６２に対応するタイトルのＡＴＳ番号＃２とＡＴＳタイトル番号＃３を取得

し、ＡＴＳ＃２のＡＴＳＩ２１１を読みとり行く。ここまでは２ｃｈ再生を選択した場合と同じである（図１２、「Ｐ１Ｍ（１）」で示すパスを参照）。また、ＡＴＳＩ２１１のＡＴＳＩ＿ＭＡＴ２７０に書かれている属性情報を記憶し、ＡＴＳ＿ＰＧＣＩＴ２７１を読み、この中のＡＴＳ＿ＰＧＣサーチポインター２７３を読みにいく（図１２、「Ｐ１Ｍ（２）」で示すパスを参照）。ここまでの処理も２ｃｈ再生を選択した場合と変わりはない。

【０２２９】このテーブルの中でＡＴＳタイトル番号（ＡＴＳ＿ＴＴＮ）が＃３のＡＴＳ＿ＰＧＣ＿ＳＲＰ２７３を探す。この場合ＡＴＳタイトル番号が＃３のＡＴＳ＿ＰＧＣＩ＿ＳＲＰが二つあり（＃３と＃４）ＰＧＣブロックを構成していることがわかる。そこで、どちらのＰＧＣ３００を選択するかを判断する。この場合、再生装置がマルチチャンネル再生に対応していて、なおかつユーザがマルチチャンネル再生を選択するように設定しているので、ブックタイプの項目を見る。ここに、チャンネル数の違いによりＰＧＣブロックを組んでいると書かれているので、次にＡｕｄｉｏ ｃｈａｎｎｅｌｓの項目２８４をみて３ｃｈ以上と書かれている方のＰＧＣ３００を選択する。そして選択したＰＧＣ３００の再生制御情報ＡＴＳ＿ＰＧＣＩ２７６の書かれているアドレス（この場合は２４５７６）を取得し、そこへジャンプし、再生制御情報を読みとり、記憶する（図１２、「Ｐ１Ｍ（３）」で示すパスを参照）。

【０２３０】以後の処理は、処理するＰＧＣ３００が異なり、再生する実体情報が異なる以外、２ｃｈ再生を選択した場合と基本的に同じである。再生制御情報の中の、プログラムに関する情報テーブルからプログラム＃１のＡＴＳ＿ＰＧＩを見て、プログラム＃１の属性を特定し、オーディオデコーダをセットする。次にＡＴＳ＿ＰＧＩから、プログラム＃１の先頭セル番号＃１のＡＴＳ＿Ｃ＿ＰＢＩを読み、セル＃１の記録されているアドレスを読みとり、そこへジャンプし再生を開始する（図１２、「Ｐ１Ｍ（４）」で示すパスを参照）。

【０２３１】（5.3.2）画像音声両用タイトルにおけるオーディオセレクション

画像音声両用タイトルをオーディオプレーヤで再生する場合を説明する。ここで、全てのタイトルグループ２６２は、１つのタイトルで構成されているものとする。再生装置がＬＰＣＭ専用であるか、ユーザがＬＰＣＭの再生を選択するように設定しているとする。また、ユーザがタイトルグループ２６２（＃ｊ）の再生を指示したとする。

【０２３２】前述したように、タイトルグループ２６２に対応するタイトル２６１のＡＴＳ番号とＡＴＳタイトル番号をＡＯＴＴ＿ＳＲＰ２４７を参照し、取得する。その結果ＡＴＳ番号は＃２、ＡＴＳタイトル番号は、＃４だったとする。ここまでの流れは（4.5.3.1）オーデ

ィオプレーヤの場合で説明したとおりである。

【０２３３】次にＡＴＳ＃２のＡＴＳＩ２１２を読みとり、ＡＴＳＩ＿ＭＡＴ２７０に書かれている属性情報を記憶する（図１３、「Ｐ２Ｌ（１）」で示すパスを参照）。この段階では、再生しようとしているタイトルの各トラックの属性を特定することはできない。とりあえず全ての属性情報を記憶しておく。また、この場合、画像音声両用タイトルを再生しようとしているので、対応するＡＴＳ２０３は、実体情報の無い、ナビゲーション情報だけのＡＴＳとなっている。

【０２３４】続いてＡＴＳ＿ＰＧＣＩＴ２７１を読み、この中のＰＧＣＩサーチポインター２７３を読みにいく（図１３、「Ｐ２Ｌ（２）」で示すパスを参照）。このテーブルの中でＡＴＳタイトル番号（ＡＴＳ＿ＴＴＮ）が＃４のＡＴＳ＿ＰＧＣＩ＿ＳＲＰ２７３を探す。この場合ＡＴＳタイトル番号が＃４のＡＴＳ＿ＰＧＣＩ＿ＳＲＰ２７３が二つあり（＃４と＃５）ＰＧＣブロックを構成していることがわかる。そこで、どちらのＰＧＣ３００を選択するか判断する。

【０２３５】この場合、再生装置がＬＰＣＭ専用であるか、ユーザがＬＰＣＭの再生を選択するように設定しているので、ブロクタイプの項目を見る。ここに、チャンネル数及び符号化方式の違いによりＰＧＣブロックを組んでいると書かれているので、次にＡｕｄｉｏ　ｃｏｄｉｎｇ　ｍｏｄｅの項目２８５をみてＬＰＣＭと書かれている方のＰＧＣ３００を選択する。

【０２３６】次に、選択したＰＧＣの再生制御情報ＡＴＳ＿ＰＧＣＩ２７６の書かれているアドレス（この場合は２４５７６）を取得し、そこへジャンプし、再生制御情報を読みとり、記憶する（図１３、「Ｐ２Ｌ（３）」で示すパスを参照）。

【０２３７】再生制御情報の中には、トラック２６１に対応する、プログラム３０１に関する情報テーブルと、セル２２０に関する情報テーブルとがある。タイトル先頭から再生を開始する場合には、プログラム＃１のＡＴＳ＿ＰＧＩを見て、プログラム＃１の属性を特定する情報と先に記憶した属性情報を使って、プログラム＃１の属性を特定する。この属性に従ってオーディオデコーダをセットする。次にＡＴＳ＿ＰＧＩから、プログラム＃１の先頭セル番号を読み（この場合、再生しようとしているのがプログラム＃１なので、当然その先頭セル番号も＃１である。）、その番号に対応するＡＴＳ＿Ｃ＿ＰＢＩからセルの記録されているアドレスを読みとり、そこへジャンプし再生を開始する（図１３、「Ｐ２Ｌ（４）」で示すパスを参照）。

【０２３８】通常再生の場合は、次のプログラムになるまで、再生中のメモリーに記憶されているＡＴＳ＿Ｃ＿ＰＢＩを使ってセルの再生を続ける。プログラムの再生が終わったら、これもメモリー中のＡＴＳ＿ＰＧＩと属性情報を使って、次のプログラム再生のための一連の処理を行い再生を開始する。この動作をタイトル終了まで繰り返す。従って前述したように、管理情報内の全ての属性情報と再生制御情報ＡＴＳ＿ＰＧＣＩを記憶していなければならない。

【０２３９】次に、再生装置が、マルチチャンネル再生及びＡＣ－３（符号化方式の一種：Ｄｏｌｂｙ　Ｄｉｇｉｔａｌ）に対応していて、ユーザがＡＣ－３の再生を選択するように設定しているとする。また、ユーザがタイトルグループ２６２（＃ｊ）の再生を指示したとする。

【０２４０】タイトルグループ２６２に対応するタイトル２６１のＡＴＳ番号＃２とＡＴＳタイトル番号＃４を取得し、ＡＴＳ＃２のＡＴＳＩ２１１を読みとり行く。ここまではＬＰＣＭ再生を選択した場合と同じである（図１３、「Ｐ２Ａ（１）」で示すパスを参照）。また、ＡＴＳＩ２１１のＡＴＳ＿ＭＡＴ２７０に書かれている属性情報を記憶し、ＡＴＳ＿ＰＧＣＩＴ２７１を読み、この中のＡＴＳ＿ＰＧＣサーチポインター２７３を読みにいく（図１３、「Ｐ２Ａ（２）」で示すパスを参照）。ここまでの処理もＬＰＣＭ再生を選択した場合と変わりはない。

【０２４１】このテーブルの中でＡＴＳタイトル番号（ＡＴＳ＿ＴＴＮ）が＃４のＰＧＣ３００を探す。この場合ＡＴＳタイトル番号が＃４のＰＧＣが二つありＰＧＣブロックを構成していることがわかる。そこで、どちらのＰＧＣ３００を選択するか判断する。

【０２４２】この場合、再生装置がマルチチャンネル再生及びＡＣ－３に対応していて、ユーザがＡＣ－３の再生を選択するように設定しているとするので、ブックタイプの項目を見る。ここに、チャンネル数及び符号化方式の違いによりＰＧＣブロックを組んでいる書かれているので、次にＡｕｄｉｏ　ｃｏｄｉｎｇ　ｍｏｄｅの項目２８５をみてＡＣ－３と書かれている方のＰＧＣを選択する。そして選択したＰＧＣの再生制御情報ＡＴＳ＿ＰＧＣＩ２７６の書かれているアドレス（この場合は３２７６８）を取得し、そこへジャンプし、再生制御情報を読みとり、記憶する（図１３、「Ｐ２Ａ（３）」で示すパスを参照）。

【０２４３】以後の処理は、処理するＰＧＣが異なり、再生するストリームが異なる以外、ＬＰＣＭ再生を選択した場合と基本的に同じである。再生制御情報の中の、プログラムに関する情報テーブルからプログラム＃１のＡＴＳ＿ＰＧＩを見て、ＰＧ＃１の属性を特定し、オーディオデコーダをセットする。次にＡＴＳ＿ＰＧＩから、プログラム＃１の先頭セル番号＃１のＡＴＳ＿Ｃ＿ＰＢＩを読み、セル＃１の記録されているアドレスを読みとり、そこへジャンプし再生を開始する（図１３、「Ｐ２Ａ（４）」で示すパスを参照）。但し、この場合再生する実体情報（ＡＯＴＴ　ＶＯＢ）が同じなので、ジャンプ先のアドレスも、ＬＰＣＭの再生を選択した場

合と同じとなる。

【０２４４】（６）再生装置

（6.1）ビデオＤＶＤプレーヤ

図１４に示すように、実施の形態に係るビデオＤＶＤプレーヤは、ピックアップ８０と、復調訂正部８１と、ストリームスイッチ８２及び８４と、トラックバッファ８３と、システムバッファ８５と、デマルチプレクサ８６と、ＶＢＶ（Video Buffer Verifier ）バッファ８７と、ビデオデコーダ８８と、サブピクチャバッファ８９と、サブピクチャデコーダ９０と、混合器９１と、オーディオバッファ９２と、オーディオデコーダ９３と、入力部９８と、ディスプレイ９９と、システムコントローラ１００と、ドライブコントローラ１０１と、スピンドルモータ１０２と、スライダモータ１０３とにより構成されている。なお、図１４に示す構成は、ビデオＤＶＤプレーヤの構成のうち、映像及び音声の再生に関する部分のみを記載したものであり、ピックアップ８０及びスピンドルモータ１０２並びにスライダモータ１０３等をサーボ制御するためのサーボ回路等は従来技術と同様であるので、記載及び細部説明を省略する。

【０２４５】次に、動作を説明する。

【０２４６】ピックアップ８０は、図示しないレーザダイオード、ビームスプリッタ、対物レンズ、光検出器等を含み、ＤＶＤ１に対して再生光としての光ビームＢを照射すると共に、当該光ビームＢのＤＶＤ１からの反射光を受光し、ＤＶＤ１上に形成されている情報ピットに対応する検出信号Ｓｐを出力する。このとき、光ビームＢがＤＶＤ１上の情報トラックに対して正確に照射されると共に、ＤＶＤ１上の情報記録面で正確に焦点を結ぶように、図示しない対物レンズに対して従来技術と同様の方法によりトラッキングサーボ制御及びフォーカスサーボ制御が施されている。

【０２４７】ピックアップ８０から出力された検出信号Ｓｐは、復調訂正部８１に入力され、復調処理及び誤り訂正処理が行われて復調信号Ｓｄｍが生成され、ストリームスイッチ８２及びシステムバッファ８５に出力される。

【０２４８】復調信号Ｓｄｍが入力されたストリームスイッチ８２は、ドライブコントローラ１０１からのスイッチ信号Ｓsw1 によりその開閉が制御され、閉のときには、入力された復調信号Ｓｄｍをそのままスルーしてトラックバッファ８３に出力する。一方、ストリームスイッチ８２が開のときには、復調信号Ｓｄｍは出力されず、不要な情報（信号）がトラックバッファ８３に入力されることがない。

【０２４９】復調信号Ｓｄｍが入力されるトラックバッファ８３は、ＦＩＦＯ（First In First Out）メモリ等により構成され、入力された復調信号Ｓｄｍを一時的に記憶すると共に、ストリームスイッチ８４が閉とされているときには、記憶した復調信号Ｓｄｍを連続的に出力する。

【０２５０】連続的に復調信号Ｓｄｍが入力されるストリームスイッチ８４は、デマルチプレクサ８６における分離処理において、後段の各種バッファがオーバーフローしたり、逆に空になってデコード処理が中断することがないように、システムコントローラ１００からのスイッチ信号Ｓsw2 により開閉が制御される。

【０２５１】一方、トラックバッファ８３と並行して復調信号Ｓｄｍが入力されるシステムバッファ８５は、ＤＶＤ１をローディングしたときに最初に検出され、ＤＶＤ１に記録されている情報全体に関する管理情報（ＶＭＧ２等）又はＶＴＳ３毎のＶＴＳ１１を蓄積して制御情報Ｓｃとしてシステムコントローラ１００に出力すると共に、再生中にナビパック４１毎のＤＳＩデータ５１を一時的に蓄積し、システムコントローラ１００に制御情報Ｓｃとして出力する。

【０２５２】ストリームスイッチ８４を介して復調信号Ｓｄｍが連続的に入力されたデマルチプレクサ８６においては、当該復調信号Ｓｄｍから各パック毎にビデオデータ、オーディオデータ、サブピクチャデータ及びナビパック毎のＰＣＩデータを抽出し、ビデオ信号Ｓｖ、副映像信号Ｓsp、オーディオ信号Ｓad並びにＰＣＩ信号Ｓpcとして、夫々ＶＢＶバッファ８７、サブピクチャバッファ８９、及びオーディオバッファ９２に出力する。

【０２５３】このとき、デマルチプレクサ８６は、各パック（オーディオパック４３を含む。）及びパケットからパックヘッダ及びパケットヘッダ等を抽出し、夫々に含まれる情報をヘッダ信号Ｓhdとしてシステムコントローラ１００に出力する。

【０２５４】ビデオ信号Ｓｖが入力されるＶＢＶバッファ８７は、ＦＩＦＯメモリ等により構成され、ビデオ信号Ｓｖを一時的に蓄積し、ビデオデコーダ８８に出力する。ＶＢＶバッファ８７は、ＭＰＥＧ２方式により圧縮されているビデオ信号Ｓｖにおける各ピクチャ（図２参照）毎のデータ量のばらつきを補償するためのものである。そして、データ量のばらつきが補償されたビデオ信号Ｓｖがビデオデコーダ８８に入力され、ＭＰＥＧ２方式により復調が行われて復調ビデオ信号Ｓvdとして混合器９１に出力される。

【０２５５】一方、副映像信号Ｓspが入力されるサブピクチャバッファ８９は、入力された副映像信号Ｓspを一時的に蓄積し、サブピクチャデコーダ９０に出力する。サブピクチャバッファ８９は、副映像信号Ｓspに含まれるサブピクチャデータ４４を、当該サブピクチャデータ４４に対応するビデオデータ４２と同期して出力するためのものである。そして、ビデオデータ４２との同期が取られた副映像信号Ｓspがサブピクチャデコーダ９０に入力され、復調が行われて復調副映像信号Ｓspd として混合器９１に出力される。

【０２５６】ビデオデコーダ８８から出力された復調ビデオ信号Ｓvd及びサブピクチャデコーダ９０から出力さ

れた復調副映像信号Ｓspd（対応する復調ビデオ信号Ｓvdとの同期が取れている。）は、混合器９１により混合され、最終的な表示すべき映像信号ＳvpとしてCRT（Cathod Ray Tube）等の表示部に出力される。

【０２５７】オーディオ信号Ｓadが入力されるオーディオバッファ９２は、ＦＩＦＯメモリ等により構成され、入力されたオーディオ信号Ｓadを一時的に蓄積し、オーディオデコーダ９３に出力する。オーディオバッファ９２は、システムコントローラ１００から出力されるヘッダ制御信号Ｓhcに基づいて、オーディオ信号Ｓadを対応する映像情報を含むビデオ信号Ｓv又は副映像信号Ｓspに同期して出力させるためのものであり、対応する映像情報の出力状況に応じてオーディオ信号Ｓadを遅延させる。そして、対応する映像情報と同期するように時間調整されたオーディオ信号Ｓadは、オーディオデコーダ９３に出力され、システムコントローラ１００から出力されるヘッダ制御信号Ｓhcに基づいて、リニアＰＣＭ方式における再生処理が施されて復調オーディオ信号Ｓaddとして図示しないスピーカ等に出力される。なお、音楽情報のみを含むオーディオＤＶＤにおいては、映像情報との同期処理は不要である。

【０２５８】（6.2）オーディオＤＶＤプレーヤ

次に、上述のオーディオＤＶＤプレーヤについて図１５を参照して説明する。図１５に示すように、オーディオＤＶＤプレーヤは図１４に示すビデオＤＶＤプレーヤと比較して、デマルチプレクサ８６の後段の構成が異なるが、それ以外は同一の構成を有する。従って、デマルチプレクサ８６以降の構成部分について説明する。

【０２５９】ストリームスイッチ８４を介して復調信号Ｓdmが連続的に入力されたデマルチプレクサ８６においては、当該復調信号Ｓdmから各パック毎にオーディオ情報を抽出し、オーディオ信号Ｓadとしてオーディオバッファ９２に出力する。

【０２６０】オーディオ信号Ｓadが入力されるオーディオバッファ９２は、ＦＩＦＯメモリ等により構成され、入力されたオーディオ信号Ｓadを一時的に蓄積し、オーディオデコーダ９３に出力する。オーディオ信号Ｓadは、オーディオデコーダ９３に入力され、システムコントローラ１００から出力される制御信号Ｓhcに基づいて、リニアＰＣＭ方式における再生処理等が施されて復調オーディオ信号Ｓaddとして図示しないスピーカ等に出力される。

【０２６１'】例えば、リアルタイムテキスト等のリアルタイム情報は、デマルチプレクサからＲＴＩバッファに出力される。ＲＴＩバッハァに一時的に蓄積されたデータは、システムコントローラ１００から出力される制御信号Ｓhcに基づいて、ＲＴＩデコーダへと出力され、図示しない表示装置に歌詞等の表示を行う。

【０２６２】所望の情報へのアクセス直後の再生等において一時的に音声を中断する（ポーズする）必要があることが検出された場合には、システムコントローラ１００からポーズ信号Ｓcaがオーディオデコーダ９３に出力され、当該オーディオデコーダ９３は一時的に復調オーディオ信号Ｓaddの出力を停止する。

【０２６３】図１６にオーディオデコーダ９３の構成を示す。図示のように、オーディオデコーダ９３は、デジタルフィルタなどを含む信号処理部１２０と、Ｄ／Ａコンバータ１２１と、アンプなどを含むアナログ出力回路１２２と、ディジタル出力回路１２３と、ＲＡＭ１２４ａを含むシステムマイコン１２４と、クロック回路１２５と、を備える。

【０２６４】システムマイコン１２４は、システムコントローラ１００との間で制御信号Ｓｃａを交換し、クロック回路１２５、信号処理部１２０、Ｄ／Ａコンバータ１２１、アナログ出力回路１２２の動作制御を行う。システムマイコン１２４は、内部にＲＡＭ１２４ａを有する。ＲＡＭ１２４ａは、システムコントローラ１００から制御信号Ｓｃａとして供給されるオーディオ属性情報を一時的に記憶する。システムマイコン１２４は、ＲＡＭ１２４ａ内に記憶されたオーディオ属性情報を参照し、その内容をクロック回路１２５及び信号処理部１２０へ供給する。具体的には、システムマイコン１２４は、オーディオ属性情報中のサンプリング周波数情報をクロック回路１２５へ供給する。クロック回路１２５は発振器を有し、指示されたサンプリング周波数に対応するクロック信号ｆｓを信号処理部１２０へ供給する。また、システムマイコン１２４は、オーディオ属性情報中のサンプリング周波数、量子化ビット数、チャンネル数、エンファシスの有無の情報を信号処理部１２０へ供給し、Ｄ／Ａコンバータ１２１へチャンネル数情報を提供する。さらに、システムマイコン１２４はアナログ出力回路１２２へ、各チャンネルの信号の増幅度などの情報を供給する。各チャンネル毎の増幅度の情報は、オーディオ属性情報に含めて、システムコントローラ１００から供給することができる。

【０２６５】信号処理部１２０は、クロック回路１２５からのクロック信号ｆｓを使用し、システムマイコン１２４から得た符号化方式（リニアＰＣＭまたはドルビーＡＣ３など）、サンプリング周波数、量子化ビット数などの情報に従って、オーディオバッファ９２から供給されるオーディオ信号の復号か、帯域制限などの処理を行い、さらに、エンファシスの有無の情報に従ってディエンファシス処理を行い、Ｄ／Ａコンバータ１２１へ出力する。Ｄ／Ａコンバータ１２１は、システムマイコン１２４から得たチャンネル情報に従って、入力された信号をチャンネル毎に分割し、さらに各チャンネル毎のアナログ信号としてアナログ出力回路１２２へ出力する。また、信号処理部１２０は、ディジタル出力回路１２３を介してディジタルオーディオ信号Ｓａｄｄを外部へ出力

する。

【０２６６】(6.3) コンパチブルＤＶＤプレーヤ

コンパチブルＤＶＤプレーヤは、図示しないが、図１５に示すオーディオＤＶＤプレーヤに、図１４に示すビデオＤＶＤプレーヤにおけるＶＢＶバッファ８７、ビデオデコーダ８８、サブピクチャバッファ８９、サブピクチャデコーダ９０、及び混合器９１を備えると共に、システムコントローラ１００を、ビデオフォーマットとオーディオフォーマットの両方の再生が可能なように構成したものである。

【０２６７】（７）再生装置におけるオーディオセレクション

再生装置におけるオーディオセレクションとは、オーディオプレーヤがオーディオタイトル又は画像音声両用タイトルを再生する場合に、再生するオーディオ情報の種類を切り換えることをいう。

【０２６８】オーディオ情報の種類としては、（5.2）オーディオ情報の記録方法で、説明したように主に以下の３種類に分類される。

【０２６９】ａ．録音状況

ｂ．符号化方式

ｃ．再生形態

（7.1）録音状況（バイノーラル）によりブロックを組んだ場合

録音状況が異なる場合は、装置の能力に関係なくユーザの好みに応じて、常時切り換えればよく、初期設定等の必要はない。またバイノーラル録音のような場合には、以下に示すような切り換え方式を再生装置が実施することも可能である。

【０２７０】ここで、バイノーラル再生を実現するためのバイノーラル録音について詳しく説明する。

【０２７１】まず通常のステレオ信号をヘッドホンで再生した場合を考える。例えば、図（Ａ）に示すように、二つのマイクロホンをコンサートホールの所定位置に配置し、これらのマイクロホンの出力をヘッドホンで再生する。この場合、再生音場は図１７（Ａ）に斜線で示すように聴取者の後頭部にできてしまう。これは、スピーカを用いた通常のステレオ再生信号音場では、音像が完全に一方のスピーカに定位されるために、左右のスピーカのレベル差は約２５ｄＢ必要となるのに対し、ヘッドホン聴取の場合には、約１０ｄＢのレベル差で完全に一方の耳に定位してしまうためである。このように、通常のステレオ録音された音楽をヘッドホンで聴くと、ステレオ感が強く出過ぎ、自然な臨場感が得られないという問題がある。

【０２７２】これに対し、バイノーラル再生では、実際の人間とほぼ等しい音響インピーダンス及び等しい特性を持つダミーヘッドを用意し、このダミーヘッドの両耳の外耳道周辺にマイクロホンを仕込み、図１７（Ｂ）に示すように、例えばこのダミーヘッドをコンサートホールの客席に置き、ダミーヘッド内のマイクロホンの出力をヘッドホンで再生する。このようなバイノーラル再生を行うと、聴取者の頭の周囲に再生される音場は、図１７（Ａ）の斜線で示した範囲となる。従って、、ヘッドホンあるいはイヤホン等による受聴においてより自然な臨場感を得ることができる。

【０２７３】このようなバイノーラル再生を実現するために、上述のようなダミーヘッドを用いて音楽の録音を行うのがバイノーラル録音であり、このようなバイノーラル録音された作品と、ステレオ録音された作品の両方を、例えば図１８に示すように、多重してＤＶＤディスクに記録しておくことにより、聴取形態に応じた適切な再生を行うことができる。なお、記録方法は多重方式に限られるものではなく、ステレオ録音されたオーディオ実体情報と、バイノーラル録音されたオーディオ実体情報を、夫々別のＡＯＢ２１０に記録するようにしても良い。

【０２７４】バイノーラル再生を行うか否かの判定は、再生装置に例えば図１５に点線で示すようにヘッドホンジャック４００を設け、このヘッドホンジャック４００にヘッドホンのプラグが挿入されたか否かにより行うこととした。

【０２７５】このヘッドホンジャック４００は、例えば図１９のような回路構成となっており、ヘッドホンのプラグとの当接により押し上げられるスイッチ部４０１が、プラグの上部と下部の両方に設けられている。そして、これらのスイッチ部４０１が押し上げられることによって、スイッチ部４０１が開状態となり、プラグが挿入されたことを検出することができる。

【０２７６】このような構成により、ヘッドホンジャック４００にヘッドホンのプラグが挿入され、ある曲の指定がユーザにより行われると、上述したような手順により、バイノーラル録音されたオーディオ実体情報を管理するＰＧＣ３００が選択され、バイノーラル録音されたオーディオ実体情報が自動的に再生される。

【０２７７】従って、ユーザは、単にヘッドホンジャック４００にヘッドホンのプラグを挿入するだけで、バイノーラル録音された所望の曲を聴くことができる。

【０２７８】なお、ヘッドホンジャック４００にヘッドホンのプラグが挿入されたか否かの検出は、再生開始時、再生中等の適宜のタイミングで行うことができる。また、ヘッドホンジャック４００にヘッドホンのプラグが挿入された時に常に倍ノーラル録音されたオーディオ実体情報を選択するのではなく、図１５に示す入力部９８による設定操作により、ユーザが優先順位を設定するように構成しても良い。例えば、ステレオ録音の再生に高い優先順位を設定していた時には、ユーザはヘッドホンでステレオ録音されたオーディオ実体情報を聞くことができる。

【０２７９】（7.2）符号化方式によりブロックを組ん

だ場合
符号化方式が異なる場合は、ディスクに記録されているオーディオ情報の符号化方式に、再生装置が対応していないと（対応するデコーダを持っていないと）、音を聞くことができない。このような状態ではユーザが混乱する。従って、全てのディスクでＬＰＣＭのオーディオ情報を記録することと、全ての再生装置がＬＰＣＭの再生ができること、とが決められている。従ってユーザは、どのようなオーディオＤＶＤディスクであっても、ＬＰＣＭ記録されたオーディオ情報だけは、再生することができる。

【０２８０】一方、現在各種の符号化方式が実用化されている。これらの多くが圧縮符号化方式であり、特にマルチチャンネルを記録する場合に、データを有効に使うことができるといった特徴を持つ。このように目的に応じて各種符号化方式によって記録されたオーディオ情報がある場合、再生装置が対応するデコーダを持っている場合のみ、その中から選択、再生することができる。この場合、再生装置は、ユーザによる一時的な設定、ユーザによる初期設定、再生装置による設定に従って、先に説明したＡＴＳ＿ＰＧＣＩ＿ＳＲＰ２７３の中の Audio coding modeの項目２８５に書かれている符号化方式を示す情報から判断し、図１９に示すフローチャートに従って最適なオーディオ情報を選択し、再生を行う。

【０２８１】なお、各設定処理は、図１４または図１５に示す入力部９８により行うように構成することができる。更に、設定した情報は、システムコントローラ１００内のメモリに記憶されるように構成することができる。

【０２８２】また、ＤＶＤディスクを再生装置にセットした際、あるいは再生を開始しようとする際等に、上述したようにＤＶＤディスクに記録された制御情報を、システムコントローラ１００によって読み取り、そのＤＶＤディスクに記録されたオーディオ実体情報の録音形態、再生形態、又は符号化方式等を、ディスプレイ９９に表示するように構成することもできる。このような構成により、ユーザは、そしＤＶＤディスクにおいて選択可能な設定を適切に知ることができ、適切な選択動作を行うことができる。

【０２８３】以下、図１９に示すフローチャートに従って、符号化方式を示す情報からＰＧＣを選択する処理の一例を説明する。

【０２８４】まず、選択処理が開始されると（ステップＳ１）、ＡＴＳ＿ＰＧＣＩ＿ＳＲＰ２７３の読み取りが行われ（ステップＳ２）、ＡＴＳ＿ＰＧＣＩ＿ＳＲＰ２７３の中に記述されている Audio coding modeの項目２８５に書かれている符号化方式を読み取る（ステップＳ３）。次に、再生装置が、読み取った符号化方式による再生を行う能力があるか否かについて判定する（ステップＳ４）。その結果、再生装置には、読み取った符号化方式による再生を行う能力がない場合には（ステップＳ４；Ｎｏ）、再びＡＴＳ＿ＰＧＣＩ＿ＳＲＰ２７３の読み取りからの処理を繰り返す（ステップＳ２～）。一方、再生装置が、読み取った符号化方式による再生を行う能力がある場合には（ステップＳ４；Ｙｅｓ）、読み取った符号化方式を、ユーザが一時的な設定として選択しているか否かを判定する（ステップＳ５）。この設定は、例えばリモートコントロール装置等により、再生を開始する際に、あるいは再生中に行われるもので、例えば特定の曲については、既存の設定とは異なる符号化方式により再生しようとする場合に行われる。前記判定の結果、読み取った符号化方式を、ユーザが一時的な設定として選択している場合には（ステップＳ５；Ｙｅｓ）、選択処理を終了し、当該ＡＴＳ＿ＰＧＣＩ＿ＳＲＰ２７３の示すＰＧＣ３００を選択し、再生を開始する（ステップＳ８）。

【０２８５】しかし、読み取った符号化方式を、ユーザが一時的な設定として選択していない場合には（ステップＳ５；Ｎｏ）、読み取った符号化方式を、ユーザが初期設定として選択しているか否かを判定する（ステップＳ６）。この初期設定は、再生装置の基本的な符号化方式を、ユーザ自信の好み等に応じて行うものであり、この初期設定を行うと、上述した一時的な設定が行われない限り、全ての曲が初期設定された符号化方式により再生されることになる。つまり、読み取った符号化方式を、ユーザが初期設定として選択している場合には（ステップＳ６；Ｙｅｓ）、選択処理を終了し、当該ＡＴＳ＿ＰＧＣＩ＿ＳＲＰ２７３の示すＰＧＣ３００を選択し、再生を開始する（ステップＳ８）。

【０２８６】また、読み取った符号化方式を、ユーザが初期設定として選択していない場合には（ステップＳ６；Ｎｏ）、読み取った符号化方式が、再生装置の設定として選択しているか否かを判定する（ステップＳ７）。この設定は、再生装置の製造段階において行われるもので、ユーザによる上述した種々の設定が行われない限り、全ての曲がこの設定された符号化方式により再生されることになる。つまり、読み取った符号化方式が、再生装置の設定として選択している場合には（ステップＳ７；Ｙｅｓ）、選択処理を終了し、当該ＡＴＳ＿ＰＧＣＩ＿ＳＲＰ２７３の示すＰＧＣを選択し、再生を開始する（ステップＳ８）。

【０２８７】なお、読み取りデータのエラー等により、読み取った符号化方式が、再生装置の設定としても選択されていない場合には（ステップＳ７；Ｎｏ）、再びＡＴＳ＿ＰＧＣＩ＿ＳＲＰ２７３の読み取りからの処理を繰り返す（ステップ２～）。

【０２８８】（7.2）再生形態によりブロックを組んだ場合
ここでいう再生形態の選択とは、２ｃｈ（ステレオ）再生を行うか、又はマルチチャンネル再生を行うかを選択

することを意味する。再生装置がマルチチャンネルに対応している場合、マルチチャンネル記録のオーディオ情報を選択し再生することができる。しかし、ユーザがマルチチャンネルを再生できるシステム（複数のアンプとスピーカ）を持っており、そのシステムに当再生装置が接続されている場合のみ、本来のマルチチャンネルとしての再生を行うことができる。従ってこの場合も、ユーザによる一時的な設定、ユーザによる初期設定、再生装置による設定に従って、先に説明したＡＴＳ＿ＰＧＣＩ＿ＳＲＰ２７３に記述されている Audio channelsの項目２８４に書かれているチャンネル数を示す情報から判断し、先にに示したフローチャートと同様な流れに従って、最適なオーディオ情報を選択し、再生を行う。

【０２８９】（7.3）符号化方式と再生形態によりブロック＊＊を組んだ場合

図１２の例でも示したように、ブロック内のオーディオ情報の種類の違いとして、符号化方式と再生形態の両方が異なる場合がある。このような場合には以下のような処理が必要となる。

【０２９０】再生装置が処理することができる各符号化方式と各再生形態の全ての組み合わせに対して優先順位を設定する。例を表２に示す。このような設定を必要に応じて、ユーザによる一時的な設定、ユーザによる初期設定、再生装置による設定の各設定で可能なようにしておく。

【０２９１】

【表２】

＊＊　符号化方式、再生形態の全ての組み合わせに対する優先順位

	ＬＰＣＭ	符号化方式Ａ	符号化方式Ｂ
２ｃｈ再生	4	5	6
マルチチャンネル再生	1	3	2

なお、表２においては、表の中の数字が小さいほど優先順位が高いことを意味する。

【０２９２】この優先順位設定に従って、図２１に示すフローチャートのように最適なオーディオ情報を選択し、再生を行う。以下、図２１に示すフローチャートに従って、最適なオーディオ情報を選択し、再生を行う処理の一例について説明する。

【０２９３】まず、選択処理が開始されると（ステップＳ１０）、ＡＴＳ＿ＰＧＣＩ＿ＳＲＰ２７３を取得し（ステップＳ１１）、ブロックタイプに応じて、ＡＴＳ＿ＰＧＣＩ＿ＳＲＰ２７３の中のAudio coding modeの項目２８５に記述されている符号化方式と、Audio channelsの項目２８４に記述されている再生形態を読み取る（ステップＳ１２）。次に、再生装置が、読み取った符号化方式及び再生形態の組み合わせによる再生を行う能力があるか否かについて判定する（ステップＳ１３）。その結果、再生装置には、読み取った符号化方式及び再生形態の組み合わせによる再生を行う能力がない場合には（ステップＳ１３；Ｎｏ）、再びＡＴＳ＿ＰＧＣＩ＿ＳＲＰ２７３の読み取りからの処理を繰り返す（ステップＳ１１～）。一方、再生装置が、読み取った符号化方式及び再生装置の組み合わせによる再生を行う能力がある場合には（ステップＳ１３；Ｙｅｓ）、読み取った符号化方式及び再生装置の組み合わせに対して、ユーザによる一時的な設定として選択することに優先順位が設定されているか否かを判定する（ステップＳ１４）。当該優先順位が設定されている場合には（ステップＳ１４；Ｙｅｓ）、読み取った符号化方式及び再生装置の組み合わせに対して、ユーザによる一時的な設定として選択することに優先順位を、優先順位番号として設定する（ステップＳ１５）。そして、この設定した優先順位番号がブロック内で最も小さいか否かを判定し（ステップＳ１９）、最も小さい場合には（ステップＳ１９；Ｙｅｓ）、選択処理を終了し、当該ＡＴＳ＿ＰＧＣＩ＿ＳＲＰ２７３の示すＰＧＣ３００を選択し、再生を開始する（ステップＳ２０）。

【０２９４】しかし、設定した優先順位番号がブロック内で最も小さい番号ではない場合には（ステップＳ１９；Ｎｏ）、当該ブロックの次のＡＴＳ＿ＰＧＣＩ＿ＳＲＰ２７３の取得からの処理を繰り返す（ステップＳ１１～）。そして、次の符号化方式及び再生形態の組み合わせについて、上述したように、再生装置に再生能力があるか否かの判定と、ユーザによる一時的な設定として優先順位が設定されているか否かの判定とを行い、判定結果に応じた処理を行う（ステップＳ１３，１４，１５）。

【０２９５】一方、次の符号化方式及び再生形態の組み合わせについて、ユーザによる一時的な設定として優先順位が設定されていない場合には（ステップＳ１４；Ｎｏ）、当該組み合わせについてユーザによる初期設定として優先順位が設定されているか否かを判定する（ステップＳ１６）。当該優先順位が設定されている場合には（ステップＳ１６；Ｙｅｓ）、読み取った符号化方式及び再生装置の組み合わせに対して、ユーザによる初期設定としての優先順位を、優先順位番号として設定する（ステップＳ１７）。そして、この設定した優先順位番号がブロック内で最も小さいか否かを判定し（ステップＳ１９）、最も小さい場合には（ステップＳ１９；Ｙｅｓ）、選択処理を終了し、当該ＡＴＳ＿ＰＧＣＩ＿ＳＲＰ２７３の示すＰＧＣ３００を選択し、再生を開始する

（ステップＳ２０）。

【０２９６】しかし、設定した優先順位番号がブロック内で最も小さい番号ではない場合には（ステップＳ１９；Ｎｏ）、当該ブロックの次のＡＴＳ＿ＰＧＣＩ＿ＳＲＰ２７３の取得からの処理を繰り返す（ステップＳ１１～）。そして、次の符号化方式及び再生形態の組み合わせについて、上述したように、再生装置に再生能力があるか否かの判定と、ユーザによる一時的な設定として優先順位が設定されているか否かの判定と、ユーザによる初期設定としての優先順位が設定されているか否かの判定とを行い、判定結果に応じた処理を行う（ステップＳ１３，１４，１５，１６，１７）。

【０２９７】一方、次の符号化方式及び再生形態の組み合わせについて、ユーザによる初期設定として優先順位が設定されていない場合には（ステップＳ１６；Ｎｏ）、当該組み合わせについて再生装置の当初からの初期設定の優先順位を、優先順位番号として設定する（ステップＳ１８）。そして、この設定した優先順位番号がブロック内で最も小さいか否かを判定し（ステップＳ１９）、最も小さい場合には（ステップＳ１９；Ｙｅｓ）、選択処理を終了し、当該ＡＴＳ＿ＰＧＣＩ＿ＳＲＰ２７３の示すＰＧＣ３００を選択し、再生を開始する（ステップＳ２０）。

【０２９８】以上のように、符号化方式と再生形態の組み合わせに対して、優先順位が設定されている場合には、設定された優先順位の中で最も小さい番号の設定態様として、当該組み合わせに基づくＰＧＣ３００の選択と、当該組み合わせによる再生を行う。

【０２９９】以上説明したように、各符号化方式、各再生形態の組み合わせに対し、必要に応じて、ユーザによる一時的な設定、ユーザによる初期設定、再生装置による設定、の各設定で優先順位を決めることが可能なようにしておくことにより、種類の異なる複数のオーディオ情報が記録された場合でも、いちいちユーザがその種類を選択することなく、最適なオーディオ情報を選択し再生することができる。

【０３００】なお、図２０と図２１を用いて説明した例において、再生装置による再生能力にも適合しておらず、また、何れの設定も選択されていないような指定が行われた場合には、ディスプレイ９９等の表示手段により、警告表示を行うように構成しても良い。

【０３０１】

【発明の効果】請求項１に記載の情報記録媒体によれば、制御情報記録領域に記録された制御情報に、前記音情報が、前記記録方式の異なる同一内容の音情報であることを示す識別情報が含まれるので、記録方式の異なる同一内容の音情報を、当該内容の下に管理することができ、ユーザに混乱を与えることなく、適切に再生させることができる。

【０３０２】請求項２に記載の情報記録媒体によれば、

制御情報に、音情報記録領域に記録された複数の音情報を第１区分単位ごとに区分するために、夫々の第１区分単位を識別する第１区分情報が含まれ、前記識別情報として、区分する音情報が同一の第１区分単位に属することを示す第１区分情報が、前記記録方式の異なる同一内容の音情報ごとに設けられるので、記録方式の異なる同一内容の音情報を、当該内容の下に管理することができる。従って、前記記録方式の異なる同一内容の音情報であっても、音情報ごとに指定する必要がないので、ユーザに混乱を与えることのない適切な再生を行わせることができる。

【０３０３】請求項３に記載の情報記録媒体によれば、記録方式の異なる同一内容の音情報が属する同一の第１区分単位を識別する第１区分情報に対しては、前記記録方式の異なる同一内容の音情報が属する同一の第２区分単位を識別する第２区分情報を、前記記録方式の異なる同一内容の音情報ごとに夫々関係付けるように、当該音情報ごとの複数の管理情報が設けられるので、記録方式の異なる同一内容の音情報を、当該内容の下に、かつ、一つの再生単位ごとに管理することができる。従って、前記記録方式の異なる同一内容の音情報であっても、音情報ごとに指定する必要がないので、ユーザに混乱を与えることのない適切な再生を行わせることができる。また、音情報の記録方式を、複数の管理情報により管理するので、ＤＶＤビデオフォーマットに記録された音情報であっても、ＤＶＤオーディオフォーマットの制御情報で再生させることが可能である。

【０３０４】請求項４に記載の情報記録媒体によれば、前記複数の管理情報の夫々は、前記第１区分情報に対し、前記記録方式の異なる同一内容の音情報ごとに、夫々等しい数及び順序の第２区分単位を識別する第２区分情報を夫々関係付けるので、第１区分単位を区切るｎ番目の第２区分単位の検索と再生を行うための手順は、前記記録方式の異なる同一内容の音情報ごとに同一とすることができ、再生処理の簡易化を図ることができる。このことは、再生装置による処理の共通化につながり、更にはユーザによる操作の共通化につながるため、ユーザに混乱を与えることのない適切な再生が可能になる。

【０３０５】請求項５に記載の情報記録媒体によれば、前記第１区分情報に対し、前記記録方式の異なる同一内容の音情報ごとに夫々関係付けられる第２区分情報により、第２区分単位ごとに区分される音情報は、前記記録方式の異なる同一内容の音情報ごとに再生時間がほぼ等しい音情報として音情報記録領域に記録されているので、夫々の記録方式に応じた再生方式により、音情報を再生する場合でも、ユーザに対して違和感を与えることがなく、ユーザに混乱を与えることをより一層確実に防止することができる。

【０３０６】請求項６に記載の情報記録媒体によれば、前記識別情報により識別される前記記録方式の異なる同

一内容の音情報は、音情報記録領域における同一の記録単位内に多重されて記録されているので、識別情報によって前記記録方式の異なる同一内容の音情報であることを識別した後に、制御情報に基づいて所望の音情報の記録された前記記録単位を検索し、検索した記録単位の中に多重された音情報のうちの所望の音情報のみを再生することができる。特に、請求項２乃至請求項５の何れかに係る発明においては、前記記録方式の異なる同一内容の複数の音情報に対しての前記記録単位の検索は、単一の第１区分情報により示される単一の第１区分単位に基づいて行われるが、、単一の第１区分情報は、前記記録方式の異なる同一内容の複数の音情報ごとに設けられているので、夫々の音情報を選択する情報を、第１区分情報レベルの階層に持たせることができる。従って、ＤＶＤビデオフォーマットで記録された音情報を、ＤＶＤオーディオフォーマットに対応した制御情報に基づいて再生することができる。

【０３０７】請求項７に記載の情報記録媒体によれば、前記制御情報には、前記記録方式の異なる同一内容の複数の音情報から、何れかの記録方式の同一内容の音情報を選択する情報として、前記記録方式を示す情報が含まれるので、所望の記録方式の同一内容の音情報の選択を容易にすることができる。また、この情報記録媒体を再生しようとする再生装置が、前記所望の記録方式に対応する再生方式を処理できないものである場合には、例えばユーザによる当該記録方式の指定が無効である旨の警告を容易に行うことができる。

【０３０８】請求項８に記載の情報記録媒体によれば、前記記録方式は、録音形態、再生形態、又は符号化方式の何れか一つ、もしくはこれらの組み合わせなので、ユーザの要求に応じた、あるいは当該情報記録媒体を再生する再生装置の能力に応じた音情報の適切な再生を、ユーザの混乱を招くことなく行うことができる。

【０３０９】請求項９に記載の再生装置によれば、情報記録媒体に記録された制御情報に含まれる識別情報により、ユーザによる指定情報に基づく音情報が、前記記録方式の異なる同一内容の複数の音情報を示すことを検知した場合には、当該複数の音情報の中から、前記選択手段により選択した記録方式の音情報を、前記制御情報に基づいて、前記選択手段により選択された記録方式により再生する再生手段とを備えるので、情報記録媒体に記録された記録方式の異なる同一内容の音情報を、ユーザに混乱を与えることなく、適切に再生することができる。

【０３１０】請求項１０に記載の再生装置によれば、前記制御情報から、当該情報記録媒体に記録された各音情報の前記記録方式を示す情報を抽出する抽出手段と、抽出した情報を表示する記録方式情報の表示手段とを更に備えるので、ユーザは記録方式に対応する所望の再生方式を指定することが可能であり、ユーザの要求に応じた適切な再生が可能である。

【０３１１】請求項１１に記載の再生装置によれば、入力手段は、再生装置の動作状態に関わらず、前記音情報の指定情報の入力を受け付けるように設定され、前記選択手段、前記検索手段、または前記再生手段は、前記入力手段により入力した前記指定情報の内容に変更があった場合には、変更された前記指定情報に基づいて、夫々の処理を行うように設定されているので、再生方式の変更等のユーザの要求をリアルタイムで音情報の再生に反映させることができ、ユーザの要求に応じたより一層適切な再生が可能である。

【０３１２】請求項１２に記載の再生装置によれば、記憶手段に記憶された設定情報の内容を書き換える書換手段を更に備えるので、再生装置の使用態様等に適合した再生方式をユーザの要求に応じて予め記憶させることができ、適切な使用環境を提供することができる。

【０３１３】請求項１３に記載の再生装置によれば、ユーザによる指定情報又は予め設定された設定情報に基づき、選択手段により選択される前記記録方式が、当該再生装置では処理できない記録方式である場合には、警告表示を行う警告表示手段を更に備えるので、ユーザは、再生装置の能力に応じた適切な記録方式の指定あるいは書き換えが可能である。

【０３１４】請求項１４に記載の再生装置によれば、前記選択手段は、初期設定状態においては、前記記憶手段に記憶された初期設定情報に基づいて記録方式の選択を行うように設定されているので、ユーザの手を煩わせることなく、その再生装置に適合した再生方式により適切な再生が可能である。

【０３１５】請求項１５に記載の再生装置によれば、選択手段が、前記警告表示手段による前記警告表示が行われない限り、まず前記入力手段により入力された指定情報、次に前記書換手段により書き換えられた設定情報、最後に前記初期設定情報、という優先順位で夫々の情報に基づく記録方式の選択を行うように設定されているので、再生装置自信の能力が最優先されるため、再生装置に適合しない記録方式の選択を防止することができる。また、再生装置に適合した記録方式の選択を行いつつ、最大限ユーザの要求を反映させた適切な再生を行うことができる。

【０３１６】請求項１６に記載の再生装置によれば、ヘッドフォンプラグのヘッドフォンジャックに対する挿入状態を検出する検出手段を更に備え、前記再生手段は、該検出手段によりヘッドフォンプラグがヘッドフォンジャックに挿入されたことを検出した場合には、バイノーラル録音された音情報を検索するように設定されているので、ユーザによる煩雑な操作を不要としつつ、使用状況に応じた適切な再生を行うことが可能である。

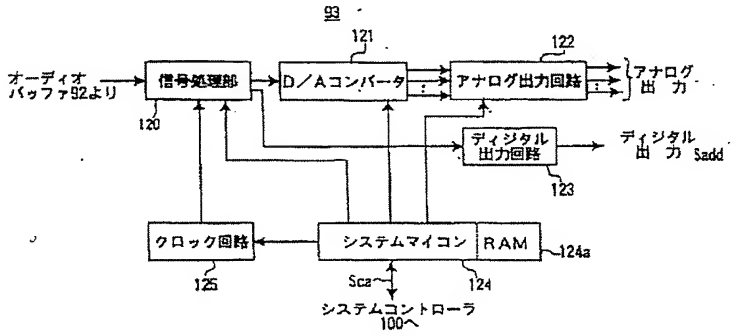
【図面の簡単な説明】

【図１】ビデオＤＶＤの物理的構造（物理フォーマッ

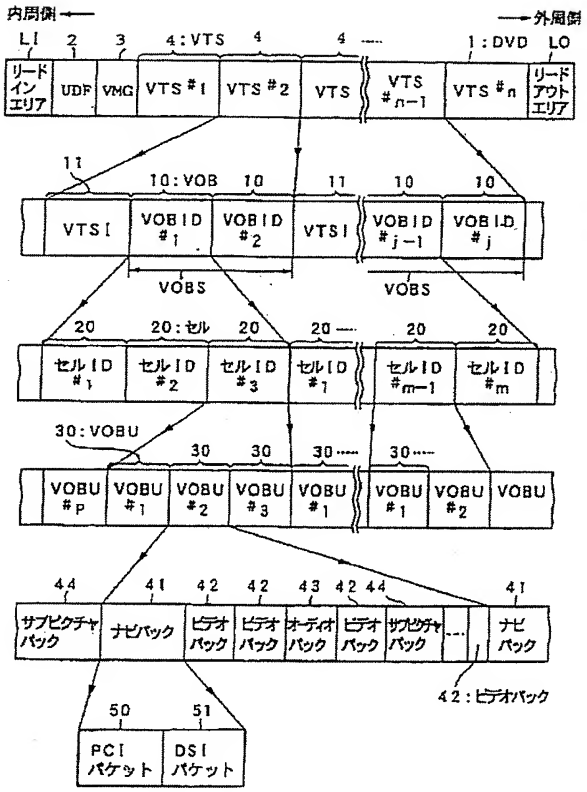
ト）を示す図である。
【図２】ビデオＤＶＤの論理的構造（論理フォーマット）を示す図である。
【図３】オーディオＤＶＤの物理的構造（物理フォーマット）を示す図である。
【図４】オーディオＤＶＤの論理的構造（論理フォーマット）を示す図である。
【図５】ＤＶＤの種類を示す図である。
【図６】オーディオ・ビデオ両用ＤＶＤの一例を示す図である。
【図７】同一オブジェクトの２重管理の概念を示す図である。
【図８】図６に示すオーディオ・ビデオ両用ＤＶＤについて規定されたナビゲーション情報の例を示す図である。
【図９】ＡＴＳに記録される情報を示す図である。
【図１０】オーディオタイトル再生時のユーザの認識とナビゲーション情報と実体情報の関係を示す図である。
【図１１】画像音声両用タイトル再生時のユーザの認識とナビゲーション情報と実体情報の関係を示す図である。
【図１２】オーディオフォーマットで記録されたＤＶＤディスクのＡＴＳＩに記録される情報を示す図である。
【図１３】オーディオフォーマット及びビデオフォーマットで記録されたＤＶＤディスクのＡＴＳＩに記録される情報を示す図である。
【図１４】ビデオＤＶＤプレーヤの概略構成を示す図である。
【図１５】オーディオＤＶＤプレーヤの概略構成を示す図である。
【図１６】図１５のオーディオＤＶＤプレーヤにおけるオーディオデコーダの構成を示す図である。
【図１７】（Ａ）は通常のステレオ再生された音楽情報＊をヘッドホンで再生した場合に形成される音場を示す図、（Ｂ）はバイノーラル再生された音楽情報をヘッドホンで再生した場合に形成される音場を示す図である。
【図１８】ステレオ方式により２チャンネル録音されたオーディオバックとバイノーラル方式により２チャンネル録音されたオーディオバックが多重化されていることを示す概念図である。
【図１９】ヘッドホンジャックの回路構成の一例を示す図である。
【図２０】符号化方式を示す情報からＰＧＣを選択する処理の一例を示すフローチャートである。
【図２１】符号化方式と再生形態を組み合わせた情報からＰＧＣを選択する処理の一例を示すフローチャートである。

【符号の説明】
３…ＶＭＧ
１０…ＶＯＢ
１１…ＶＴＳＩ
２０２…ＡＭＧ
２０４…ＳＡＰＰＴ
２１０…ＡＯＢ
２１１…ＡＴＳＩ
２４０…ＡＭＧＩ
２４２…ＡＴＴサーチポインタテーブル
２４３…ＡＯＴＴサーチポインタテーブル
２４５…ＡＴＴサーチポインタ
２４７…ＡＯＴＴサーチポインタ
２５１…ＴＴサーチポインタテーブル
２５４…ＴＴサーチポインタ
２６１…タイトル
３００…ＰＧＣ
３０１…プログラム

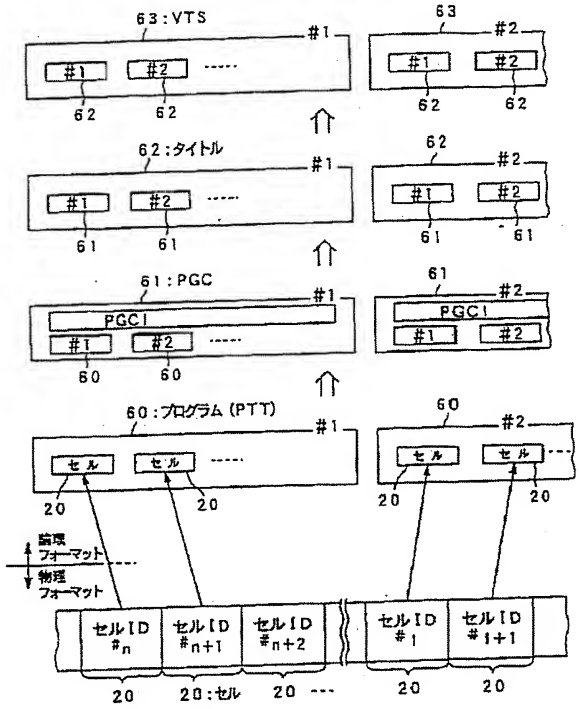
【図１６】



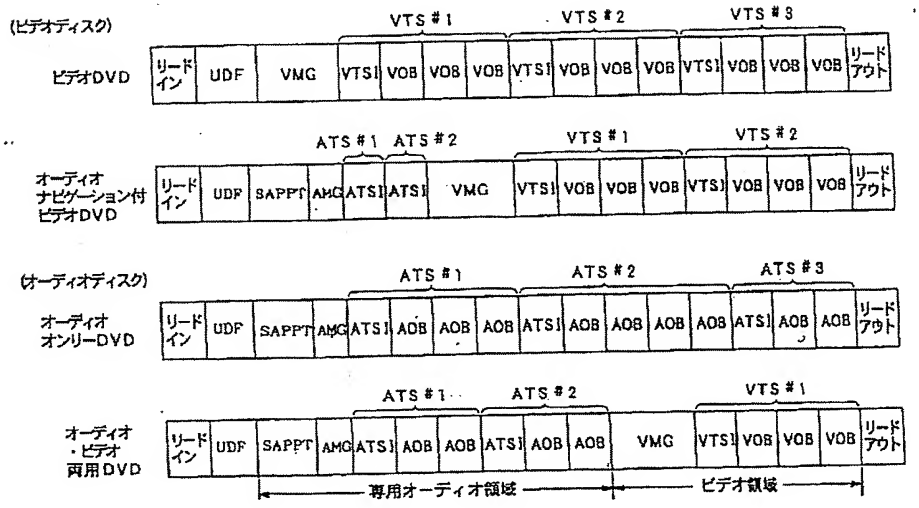
【図１】


内周側
外周側
LI
2
3
4:VTS
4
4
1:DVD
LO
リードインエリア
UDF
VMG
VTS #1
VTS #2
VTS
VTS #n-1
VTS #n
リードアウトエリア
11
10:VOB
10
11
10
10
VTSI
VOB ID #1
VOB ID #2
VTSI
VOB ID #j-1
VOB ID #j
VOBS
VOBS
20
20:セル
20
20
20
20
セル ID #1
セル ID #2
セル ID #3
セル ID #1
セル ID #m-1
セル ID #m
30:VOBU
30
30
30
30
VOBU #P
VOBU #1
VOBU #2
VOBU #3
VOBU #1
VOBU #1
VOBU #2
VOBU
44
41
42
42
43
42
44
41
サブピクチャパック
ナビパック
ビデオパック
ビデオパック
オーディオパック
ビデオパック
サブピクチャパック
ナビパック
42:ビデオパック
50
51
PCI パケット
DSI パケット

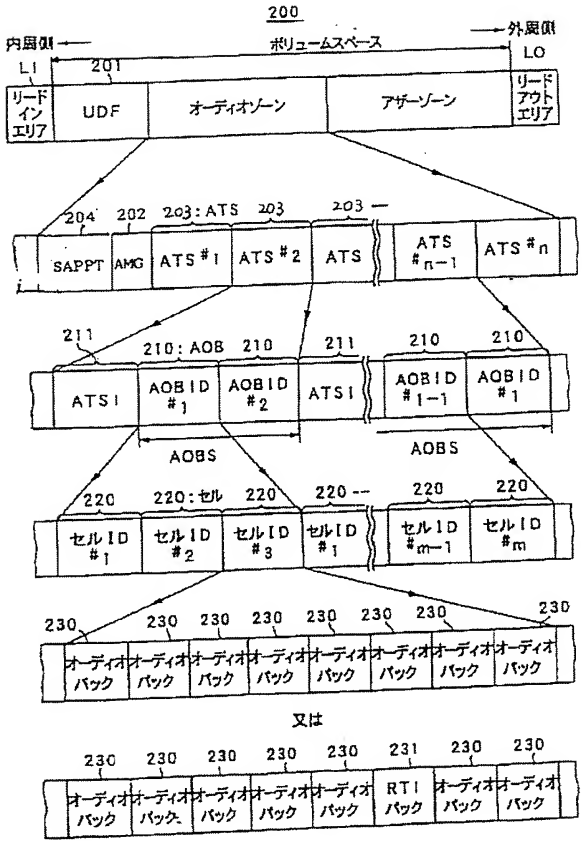
【図２】


63:VTS
#1
#2
62
62
63
#1
#2
62
62
62:タイトル
#1
#2
61
61
62
#1
#2
61
61
61:PGC
#1
PGC
#1
#2
60
60
61
#2
PGC
#1
#2
60:プログラム(PTT)
#1
セル
セル
20
20
60
#2
セル
セル
20
20
論理フォーマット
物理フォーマット
セル ID #n
セル ID #n+1
セル ID #n+2
セル ID #1
セル ID #1+1
20
20:セル
20
20
20

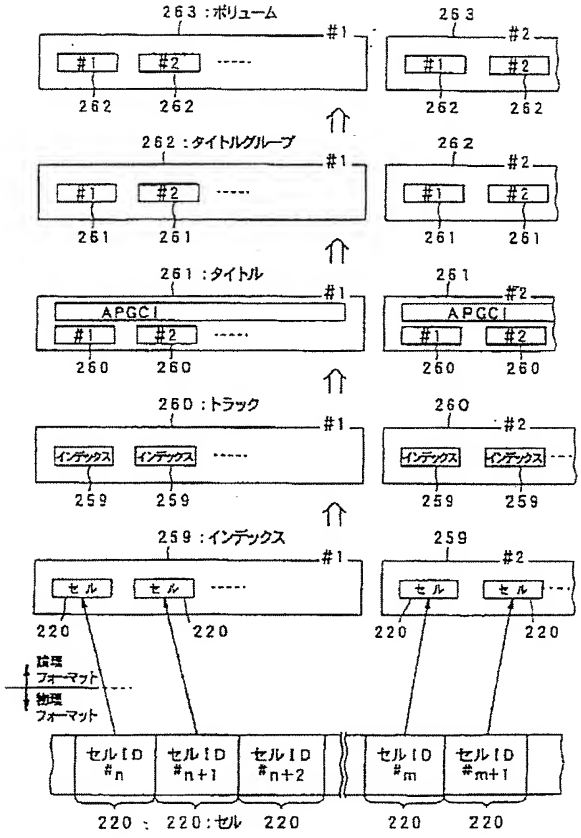
【図５】


(ビデオディスク)
ビデオDVD
VTS #1
VTS #2
VTS #3
リードイン
UDF
VMG
VTSI
VOB
リードアウト
オーディオナビゲーション付ビデオDVD
ATS #1
ATS #2
SAPPT
AMG
ATSI
(オーディオディスク)
オーディオオンリーDVD
AOB
オーディオ・ビデオ両用DVD
専用オーディオ領域
ビデオ領域

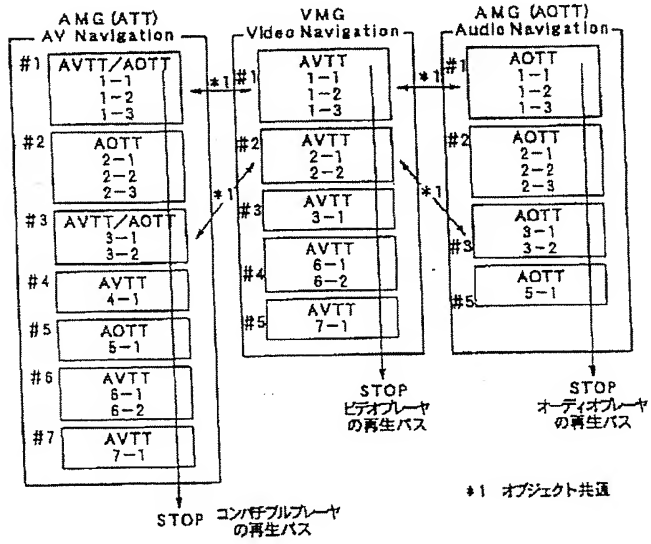
【図３】


200
内周側
外周側
ボリュームスペース
L1
LO
201
リードインエリア
UDF
オーディオゾーン
アザーゾーン
リードアウトエリア
204
202
203:ATS
203
203
SAPPT
AMG
ATS #1
ATS #2
ATS
ATS #n-1
ATS #n
211
210:AOB
210
211
210
210
ATSI
AOB ID #1
AOB ID #2
ATSI
AOB ID #1-1
AOB ID #1
AOBS
AOBS
220
220:セル
220
220
220
220
セル ID #1
セル ID #2
セル ID #3
セル ID #1
セル ID #m-1
セル ID #m
230
オーディオパック
又は
230
231
RTI パック

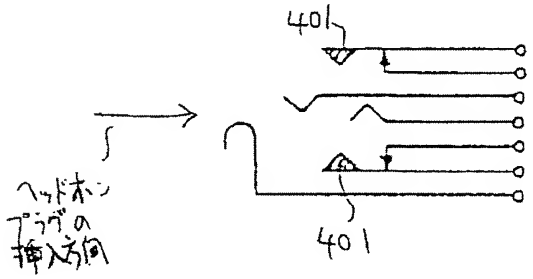
【図４】


263:ボリューム
#1
#2
262
262:タイトルグループ
261
261:タイトル
APGCI
260
260:トラック
インデックス
259
259:インデックス
セル
220
論理フォーマット
物理フォーマット
セル ID #n
セル ID #n+1
セル ID #n+2
セル ID #m
セル ID #m+1
220:セル

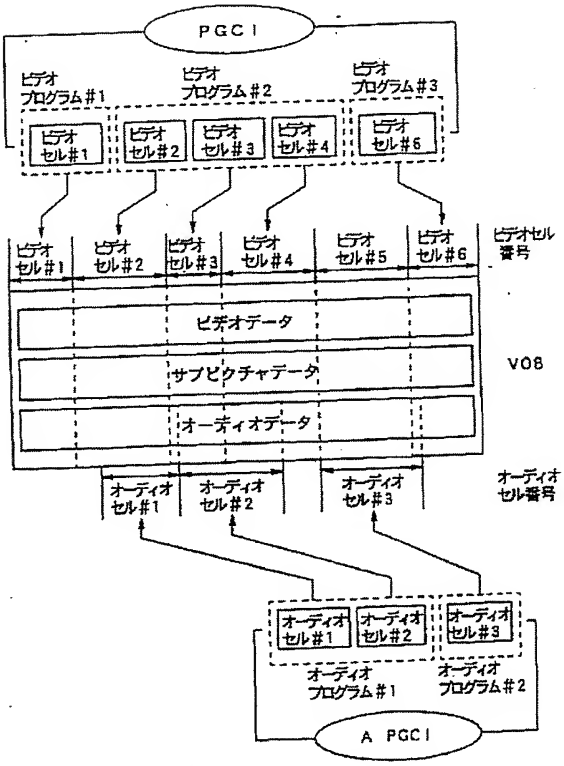
【図６】


AMG (ATT)
AV Navigation
VMG
Video Navigation
AMG (AOTT)
Audio Navigation
AVTT/AOTT
AOTT
AVTT
STOP
ビデオプレーヤの再生パス
STOP
オーディオプレーヤの再生パス
STOP
コンパチブルプレーヤの再生パス
*1 オブジェクト共通

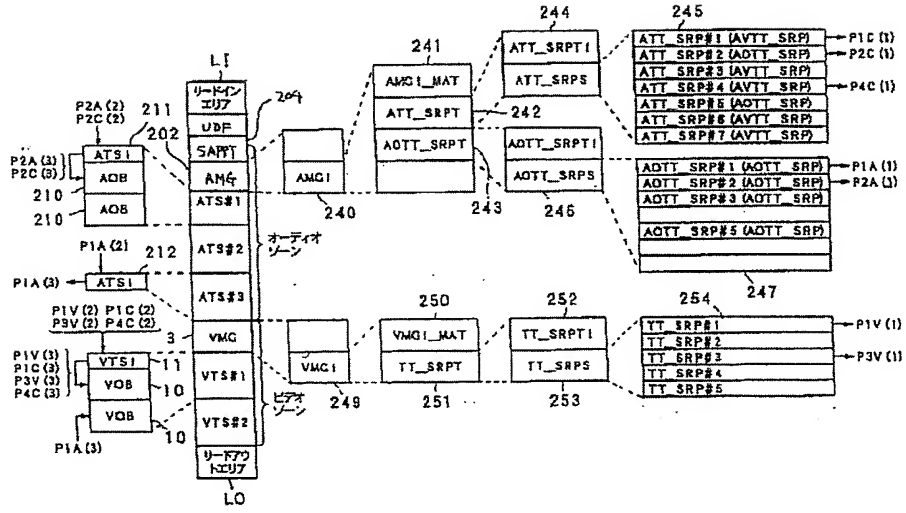
【図１９】


401
401
ヘッドホンプラグの挿入方向

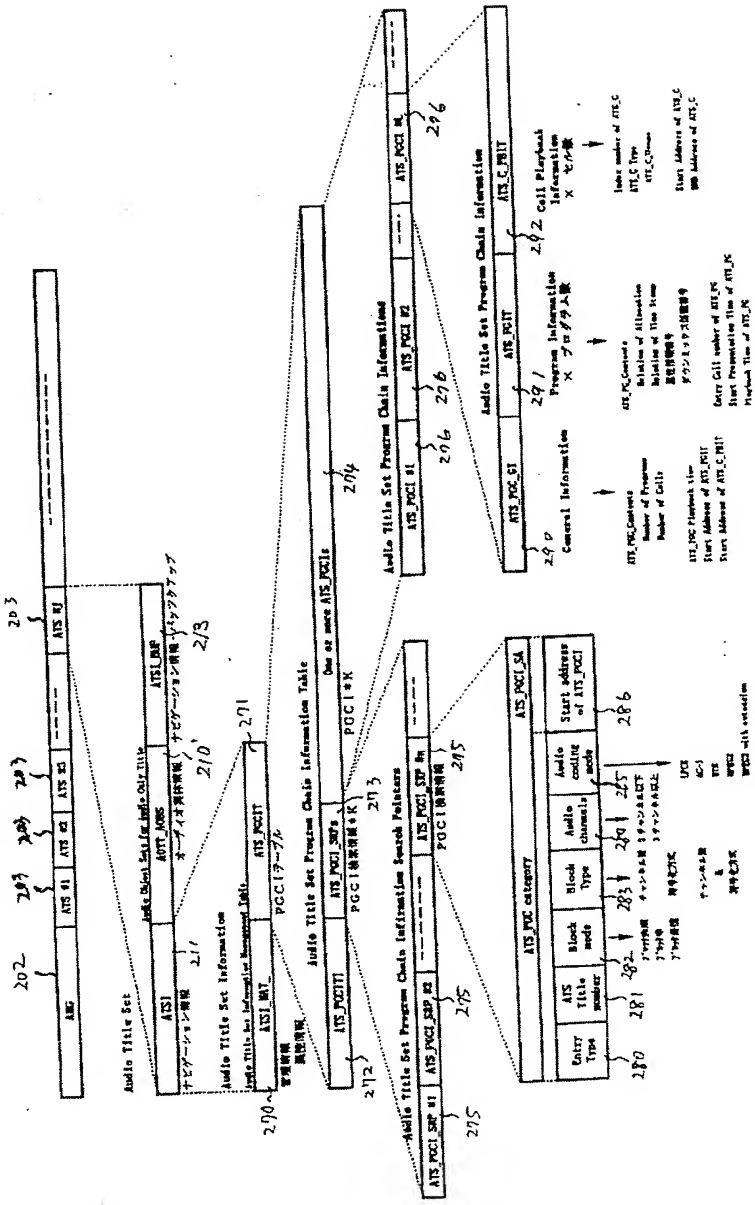
【図７】


PGC I
ビデオ プログラム#1
ビデオ プログラム#2
ビデオ プログラム#3
ビデオ セル#1
ビデオ セル#2
ビデオ セル#3
ビデオ セル#4
ビデオ セル#5
ビデオ セル#6
ビデオセル 番号
ビデオデータ
サブピクチャデータ
オーディオデータ
VOB
オーディオ セル#1
オーディオ セル#2
オーディオ セル#3
オーディオ セル番号
オーディオ プログラム#1
オーディオ プログラム#2
A PGC I

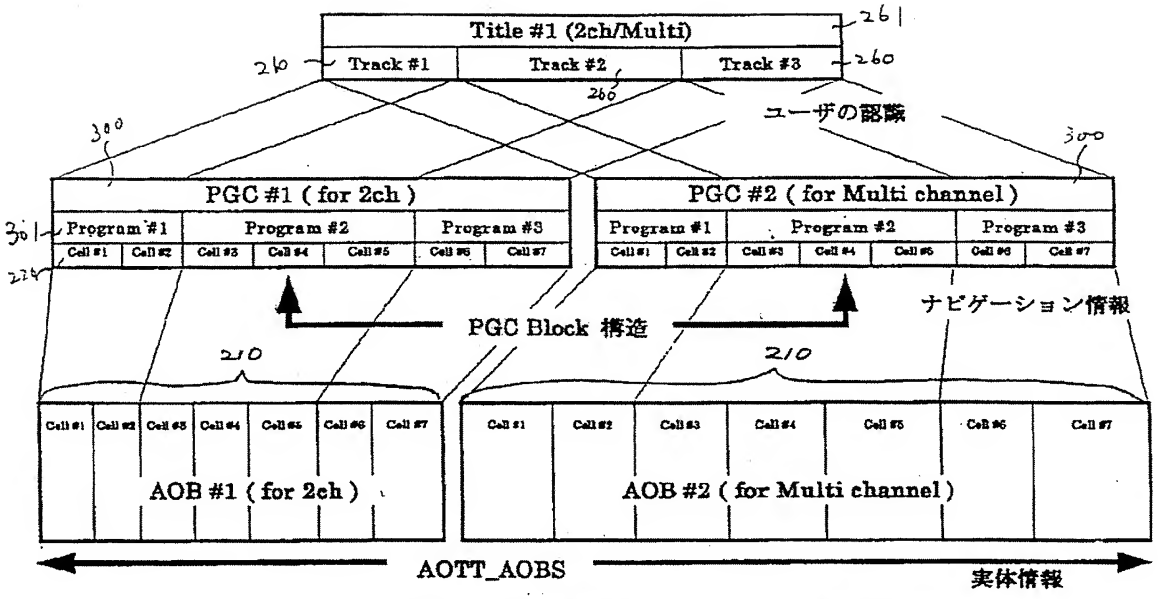
【図８】


LI
リードイン エリア
UDF
SAPT
AMG
ATS#1
ATS#2
ATS#3
VMG
VTS#1
VTS#2
リードアウト エリア
LO
ATS I
AOB
VTS I
VOB
AMG I
VMG I
オーディオ ゾーン
ビデオ ゾーン
AMG I_MAT
ATT_SRPT
AOTT_SRPT
ATT_SRPT I
ATT_SRPS
AOTT_SRPT I
AOTT_SRPS
VMG I_MAT
TT_SRPT
TT_SRPT I
TT_SRPS
ATT_SRP#1 (AVTT_SRP)
ATT_SRP#2 (AOTT_SRP)
ATT_SRP#3 (AVTT_SRP)
ATT_SRP#4 (AVTT_SRP)
ATT_SRP#5 (AOTT_SRP)
ATT_SRP#6 (AOTT_SRP)
ATT_SRP#7 (AVTT_SRP)
AOTT_SRP#1 (AOTT_SRP)
AOTT_SRP#2 (AOTT_SRP)
AOTT_SRP#3 (AOTT_SRP)
AOTT_SRP#5 (AOTT_SRP)
TT_SRP#1
TT_SRP#2
TT_SRP#3
TT_SRP#4
TT_SRP#5
P1C (1)
P2C (1)
P4C (1)
P1A (1)
P2A (1)
P1V (1)
P3V (1)
P2A (2) P2C (2)
P2A (3) P2C (3)
P1A (2)
P1A (3)
P1V (2) P1C (2) P3V (2) P4C (2)
P1V (3) P1C (3) P3V (3) P4C (3)
211
202
204
210
212
3
11
10
240
241
242
243
244
245
246
247
249
250
251
252
253
254

【図9】

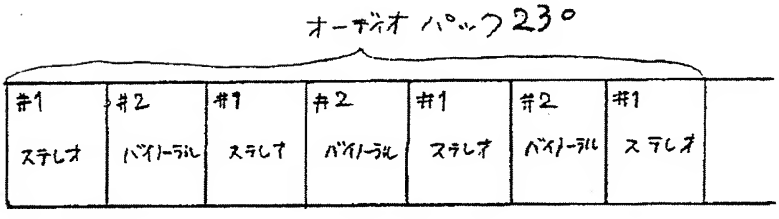


【図１０】

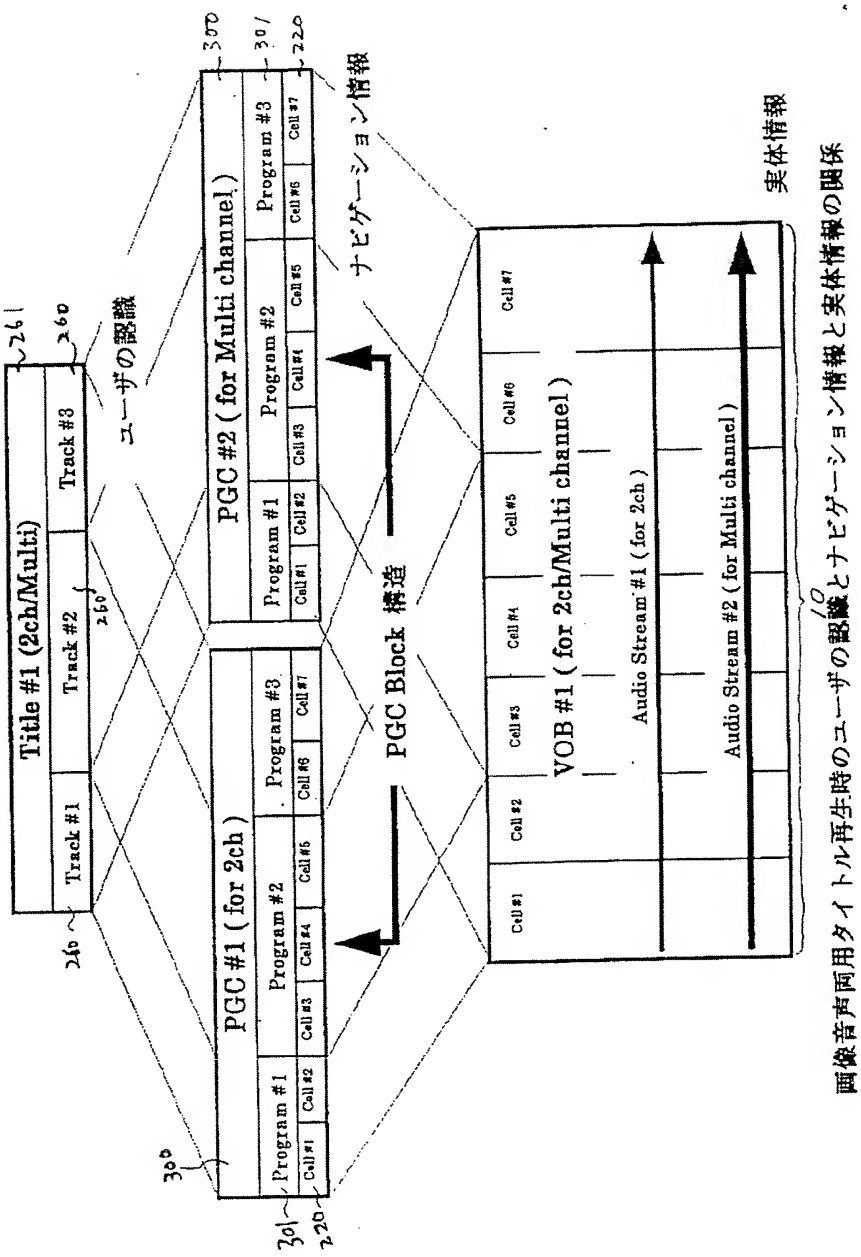


オーディオタイトル再生時のユーザの認識とナビゲーション情報と実体情報の関係

【図１８】

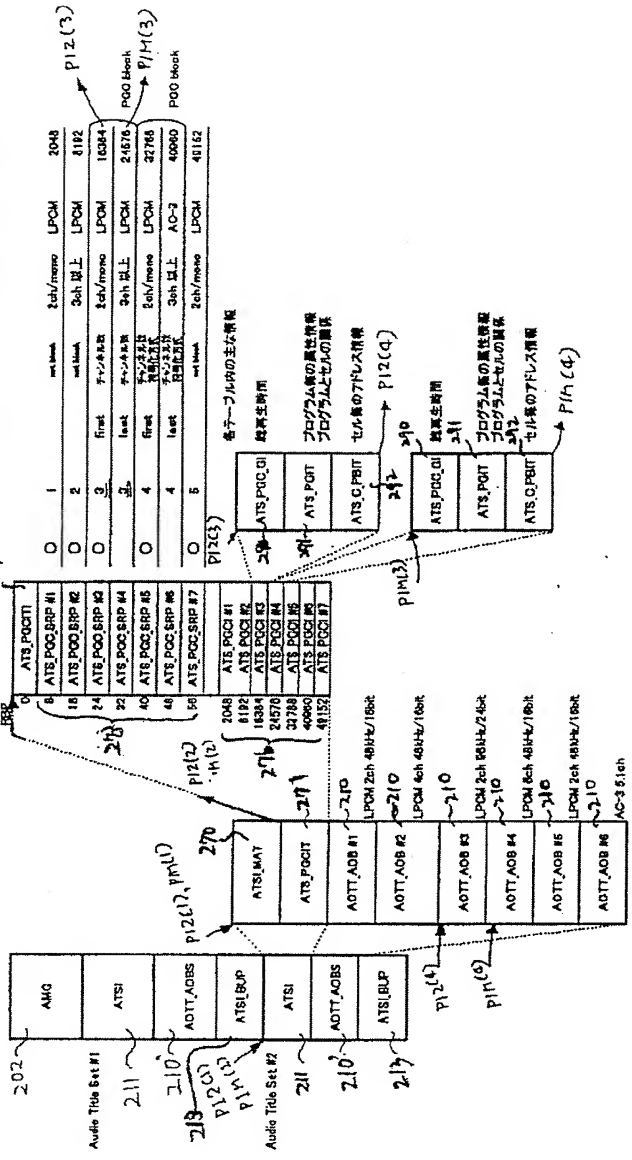


【図１１】

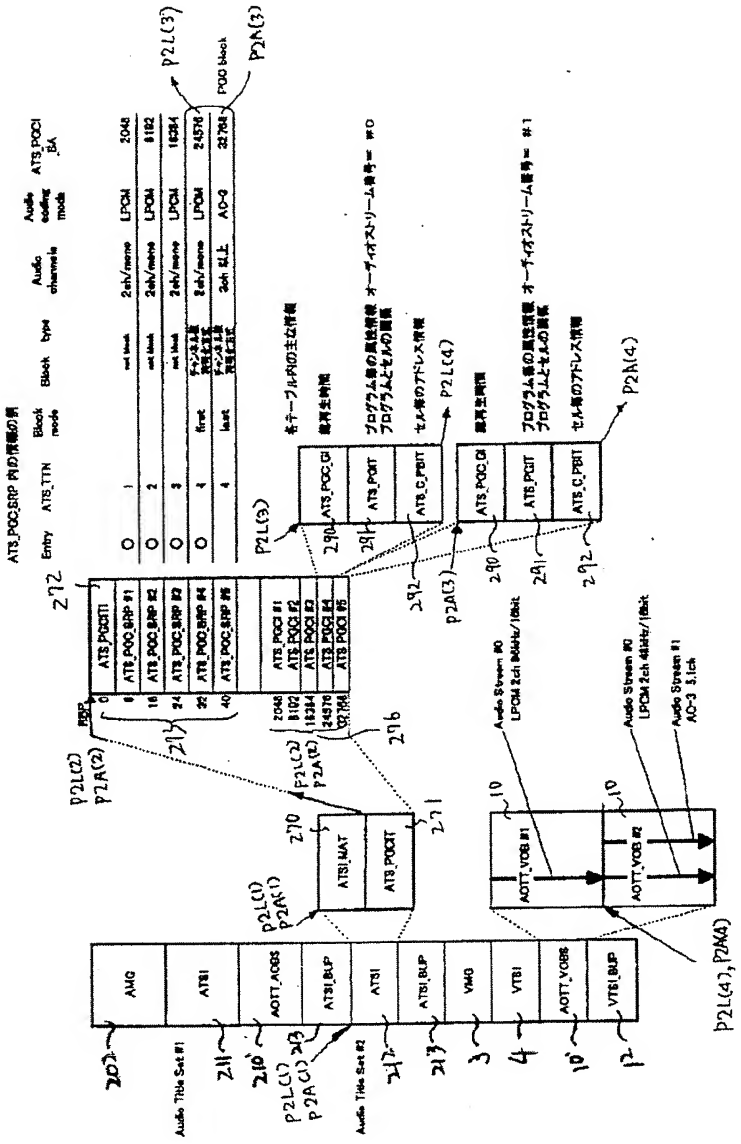


画像音声両用タイトル再生時のユーザの認識とナビゲーション情報と実体情報の関係

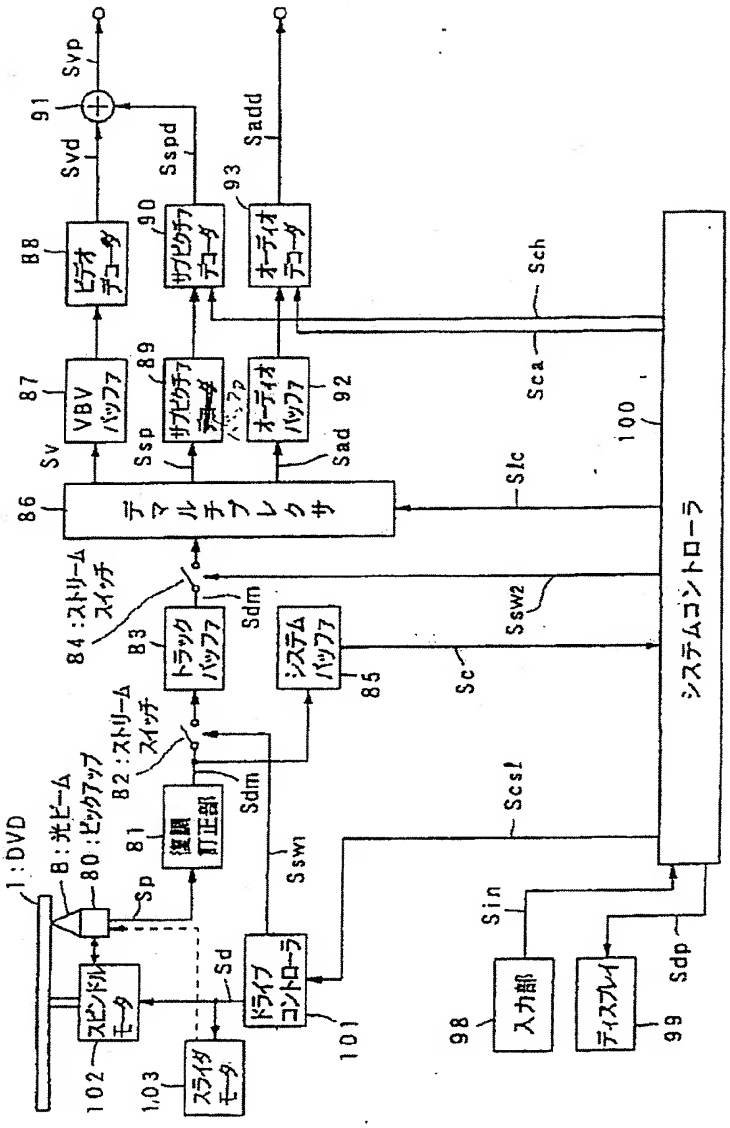
【図１２】


AMG
ATSI
AOTT_AOBS
ATSI_BUP
ATSI_MAT
ATS_PGCIT
ATS_PGCI_SA
ATS_PGCM
ATS_PGC_GI
ATS_PGIT
ATS_C_PBIT
Audio Title Set #1
Audio Title Set #2
LPCM 2ch 48kHz/16bit
LPCM 6ch 48kHz/16bit
LPCM 2ch 96kHz/24bit
LPCM 8ch 48kHz/16bit
AC-3 5.1ch
PGC Block
Entry
Block mode
Block type
Audio channels
Audio coding mode

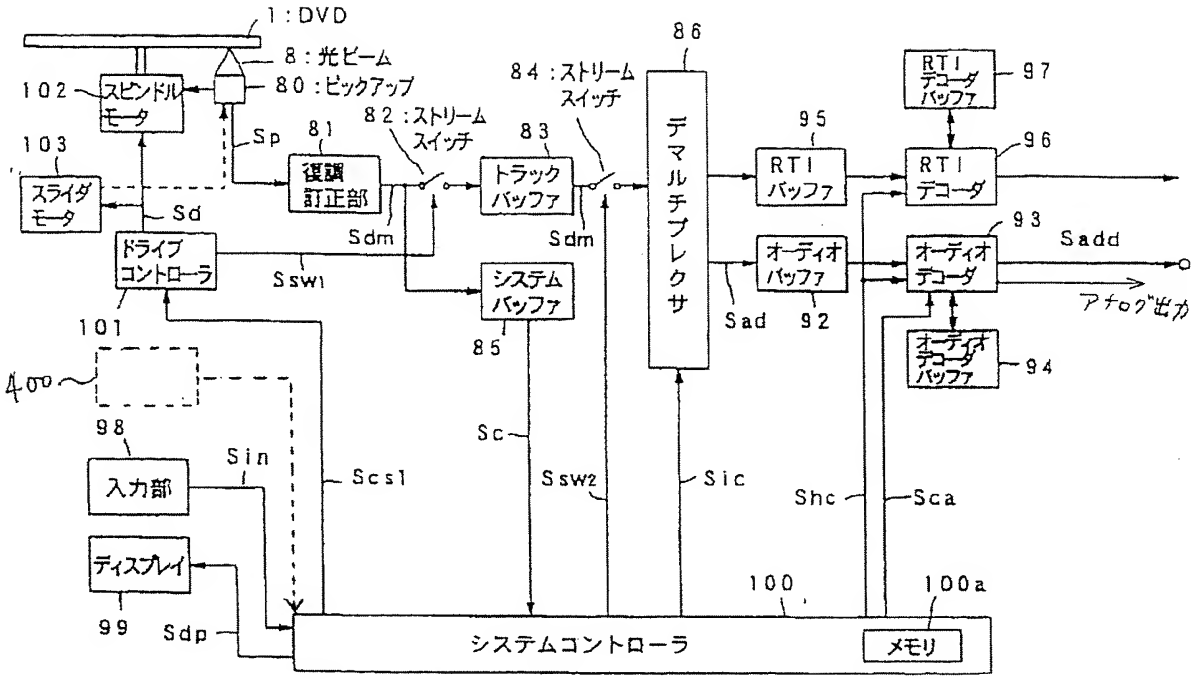
【図13】


AMG
ATSI
AOTT_AOBS
ATSI_BUP
ATSI
ATSI_BUP
VMG
VTSI
AOTT_VOBS
VTSI_BUP
ATSI_MAT
ATS_PGCIT
AOTT_VOB #1
AOTT_VOB #2
ATS_PGCI
ATS_PGIT
ATS_C_PBIT
Audio Title Set #1
Audio Title Set #2
Audio Stream #0
LPCM 2ch 96kHz/16bit
Audio Stream #0
LPCM 2ch 48kHz/16bit
Audio Stream #1
AC-3 5.1ch
ATS_PGCIT 内の情報の例
Entry
ATS_TTN
Block mode
Block type
Audio channels
Audio coding mode
ATS_PGCI #BA
LPCM
AC-3
POG block
プログラム毎の属性情報 オーディオストリーム番号= #0
プログラム上セルの開始
セル毎のアドレス情報
プログラム毎の属性情報 オーディオストリーム番号= #1
プログラム上セルの開始
セル毎のアドレス情報
キーブロックの主な内容
属性生成情報
P2L(1)
P2A(1)
P2L(2)
P2A(2)
P2L(3)
P2A(3)
P2L(4)
P2A(4)
P2L(4), P2A(4)

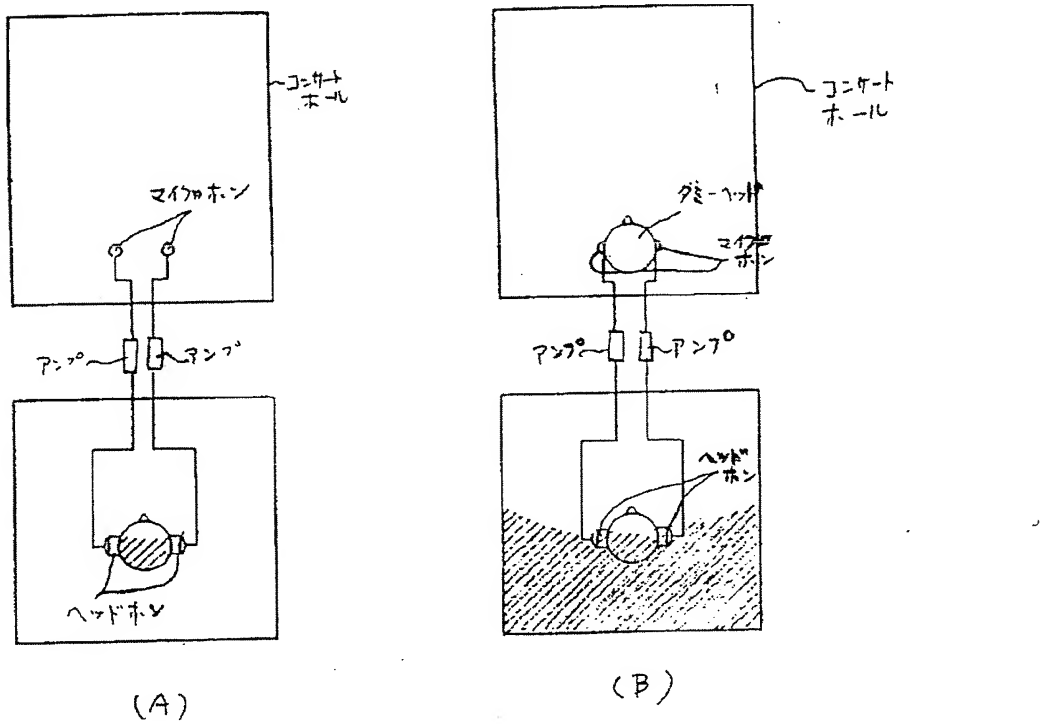
【図１４】


1:DVD
8:光ピーム
80:ピックアップ
81
復調 訂正部
82:ストリーム スイッチ
83
トラック バッファ
84:ストリーム スイッチ
85
システム バッファ
86
デマルチプレクサ
87
VBV バッファ
88
ビデオ デコーダ
89
サブピクチャ デコーダ バッファ
90
サブピクチャ デコーダ
91
92
オーディオ バッファ
93
オーディオ デコーダ
98
入力部
99
ディスプレイ
100
システムコントローラ
101
ドライブ コントローラ
102
スピンドル モータ
103
スライダ モータ
Sv
Svp
Svd
Ssp
Sspd
Sad
Sadd
Sdm
Sc
Sswi
Sswi
Sp
Sd
Sin
Sdp
Sch
Sca
Slc
Scs!

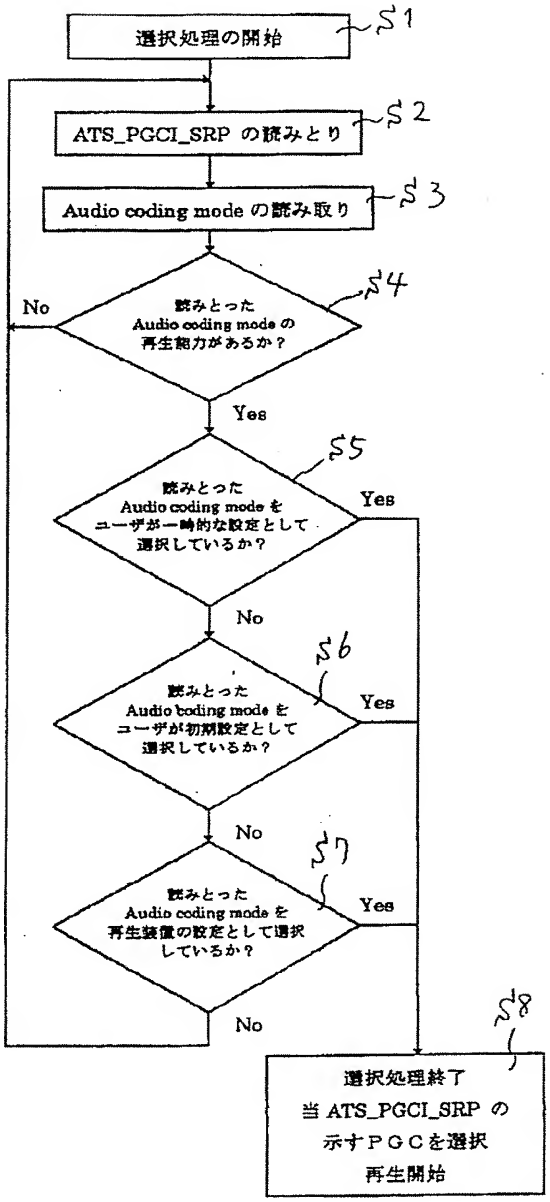
【図１５】


1:DVD
8:光ビーム
80:ピックアップ
102
スピンドルモータ
103
スライダモータ
Sp
Sd
81
復調訂正部
82:ストリームスイッチ
Sdm
ドライブコントローラ
Ssw1
101
400
98
入力部
Sin
Scs1
ディスプレイ
99
Sdp
83
トラックバッファ
Sdm
84:ストリームスイッチ
システムバッファ
85
Sc
Ssw2
86
デマルチプレクサ
Sic
95
RTIバッファ
オーディオバッファ
Sad
92
RTIデコーダバッファ
97
RTIデコーダ
96
オーディオデコーダ
93
Sadd
アナログ出力
オーディオデコーダバッファ
94
Shc
Sca
100
100a
システムコントローラ
メモリ

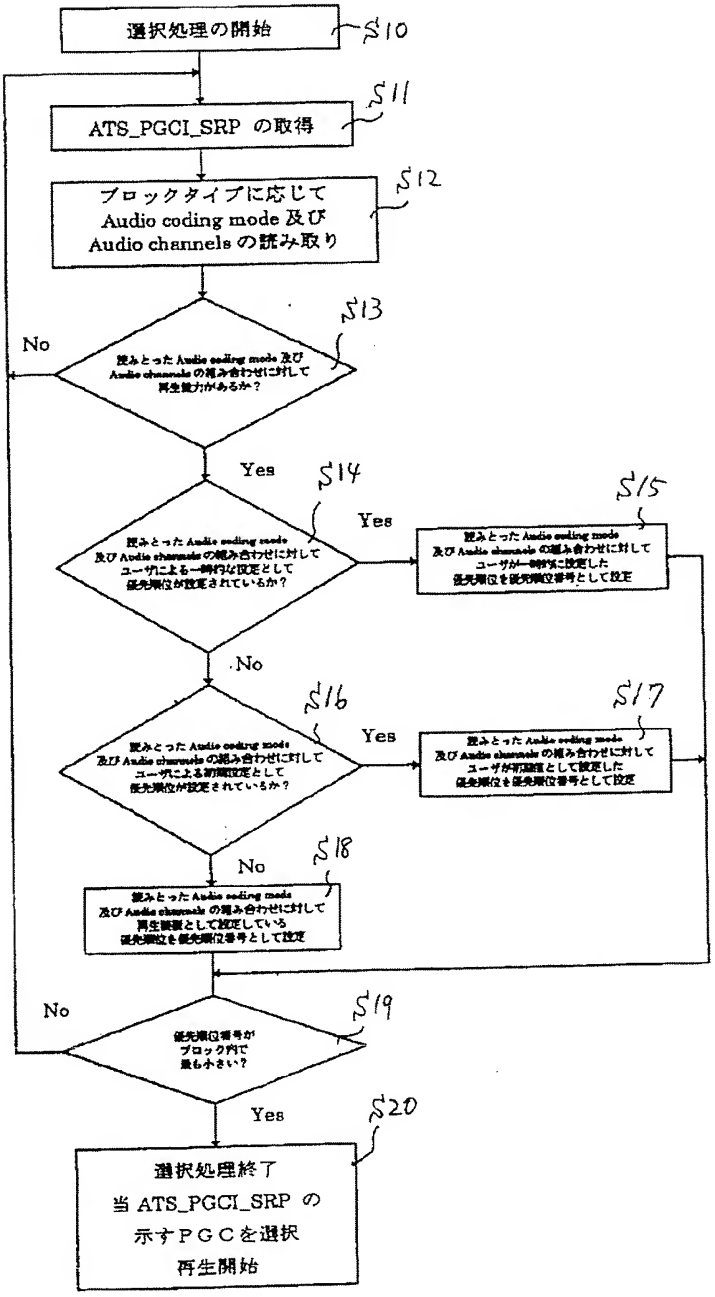
【図１７】


コンサートホール
マイクロホン
アンプ
アンプ
ヘッドホン
(A)
コンサートホール
ダミーヘッド
マイクロホン
アンプ
アンプ
ヘッドホン
(B)

【図２０】

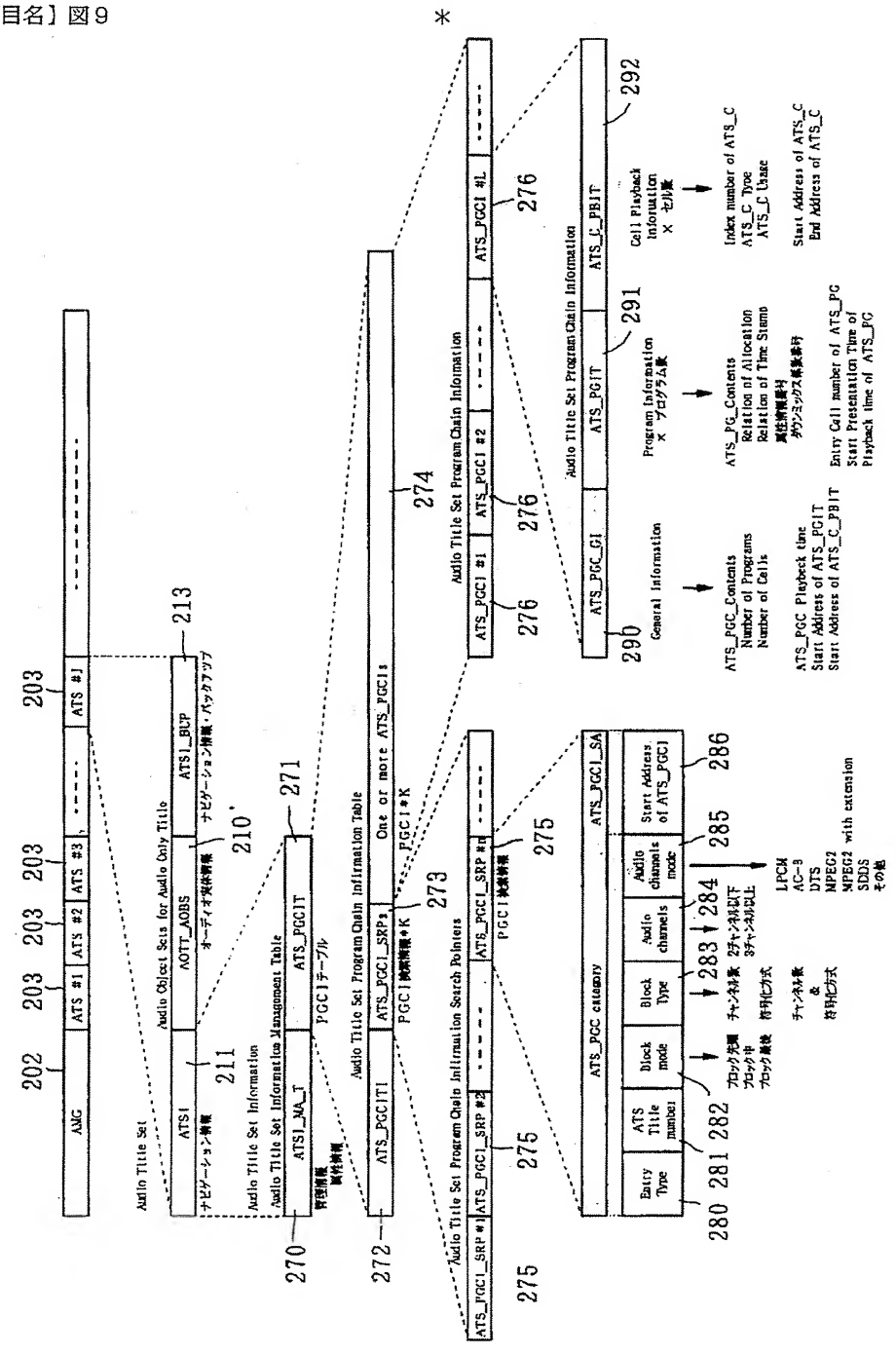

選択処理の開始
S1
ATS_PGCI_SRP の読みとり
S2
Audio coding mode の読み取り
S3
読みとった Audio coding mode の再生能力があるか？
S4
No
Yes
読みとった Audio coding mode をユーザが一時的な設定として選択しているか？
S5
Yes
No
読みとった Audio coding mode をユーザが初期設定として選択しているか？
S6
Yes
No
読みとった Audio coding mode を再生装置の設定として選択しているか？
S7
Yes
No
選択処理終了
当 ATS_PGCI_SRP の示すＰＧＣを選択
再生開始
S8

【図２１】


選択処理の開始
S10
ATS_PGCI_SRP の取得
S11
ブロックタイプに応じて
Audio coding mode 及び
Audio channels の読み取り
S12
S13
No
Yes
S14
Yes
S15
No
S16
Yes
S17
No
S18
No
S19
Yes
S20
選択処理終了
当 ATS_PGCI_SRP の
示すＰＧＣを選択
再生開始

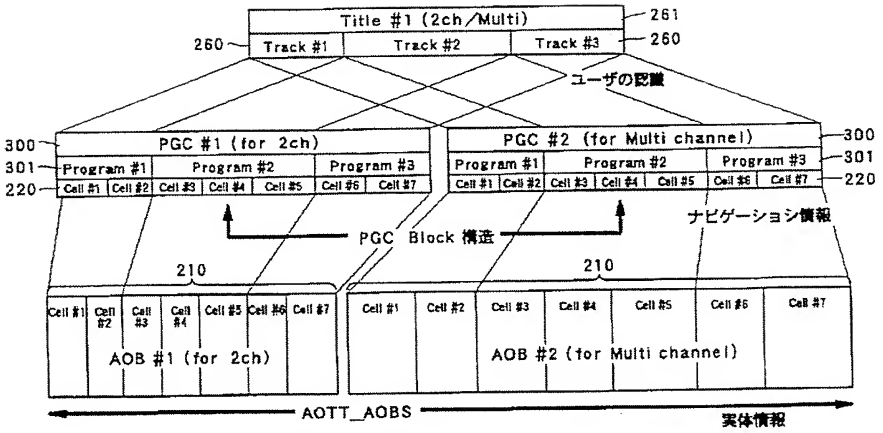
【手続補正書】
【提出日】平成１０年４月２２日
【手続補正１】
【補正対象書類名】図面
【補正対象項目名】図９

＊【補正方法】変更
【補正内容】
【図９】



【手続補正２】
【補正対象書類名】図面
【補正対象項目名】図１０

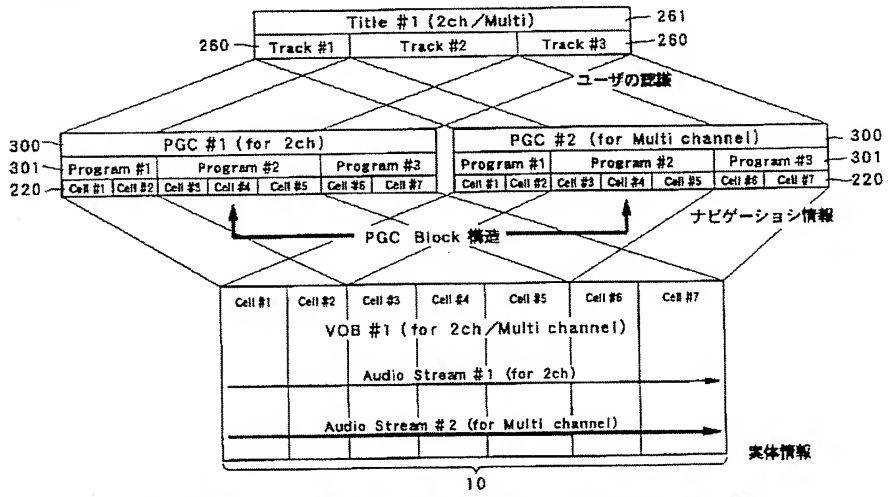
【補正方法】変更
【補正内容】
【図１０】



オーディオタイトル再生時のユーザの認識とナビゲーション情報と実体情報の関係

【手続補正３】
【補正対象書類名】図面
【補正対象項目名】図１１

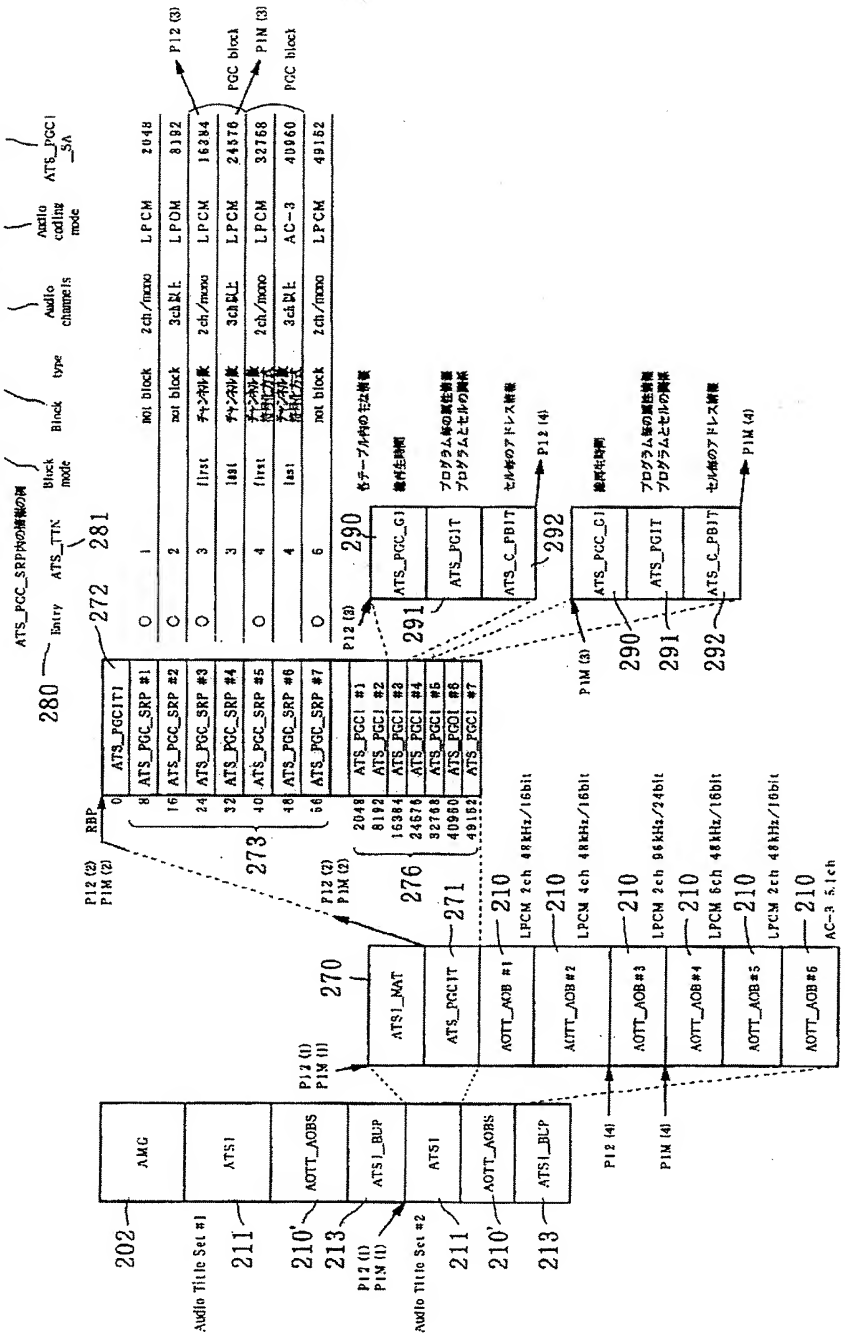
＊【補正方法】変更
【補正内容】
＊　【図１１】



画像音声両用タイトル再生時のユーザの認識とナビゲーション情報と実体情報の関係

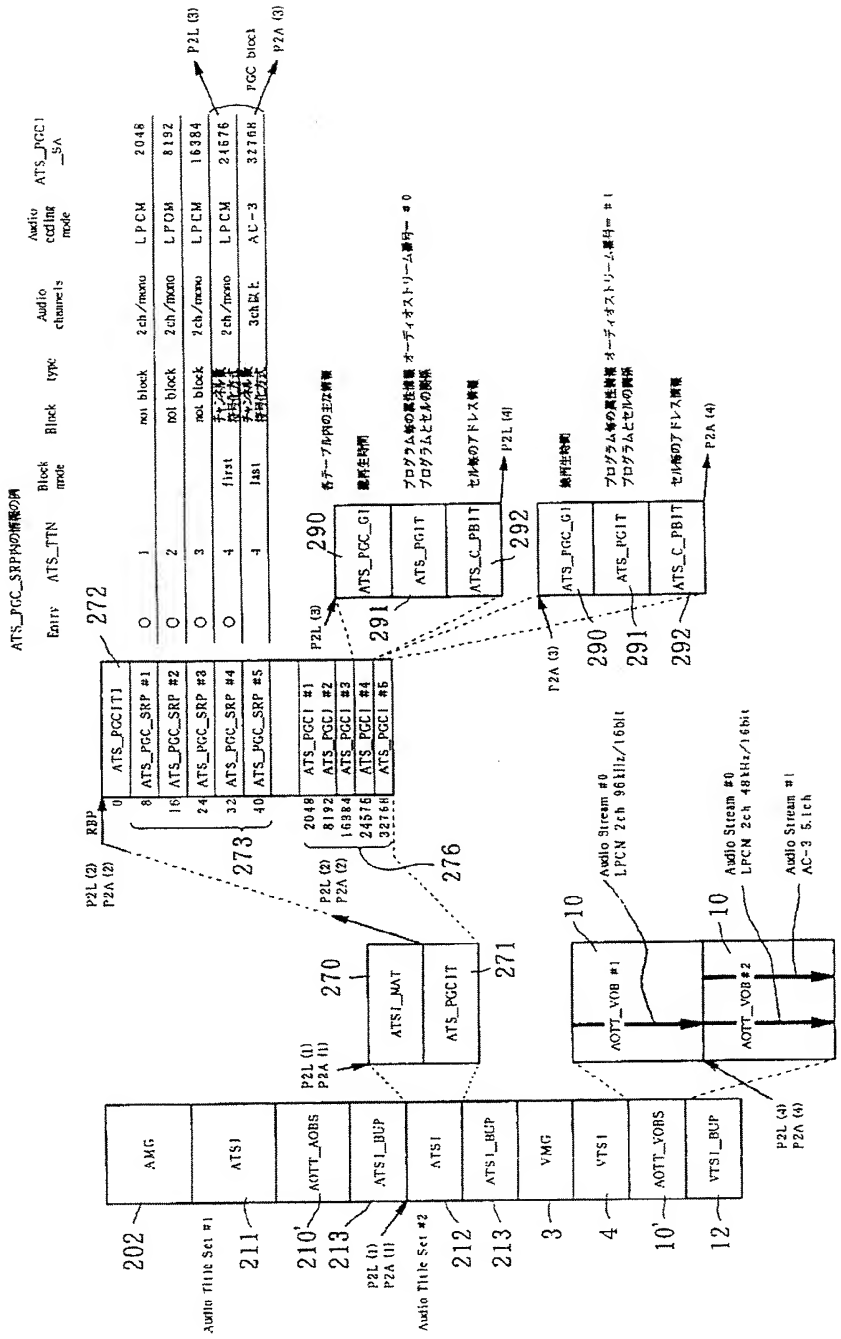
【手続補正４】
【補正対象書類名】図面
【補正対象項目名】図１２

【補正方法】変更
【補正内容】
【図１２】



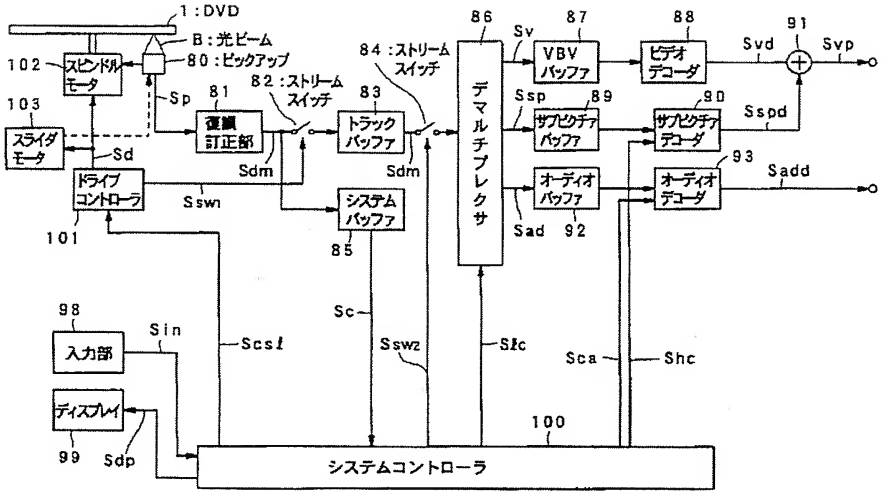
【手続補正５】
【補正対象書類名】図面
【補正対象項目名】図１３

【補正方法】変更
【補正内容】
【図１３】



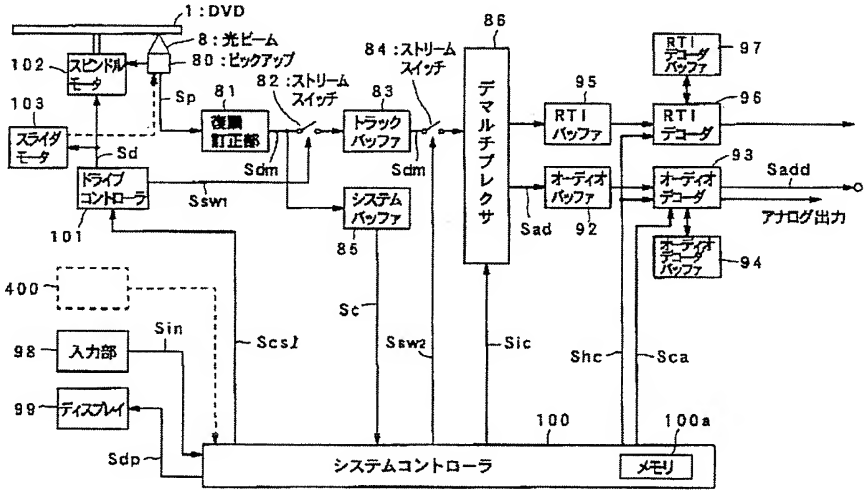
【手続補正６】
【補正対象書類名】図面
【補正対象項目名】図１４

【補正方法】変更
【補正内容】
【図１４】



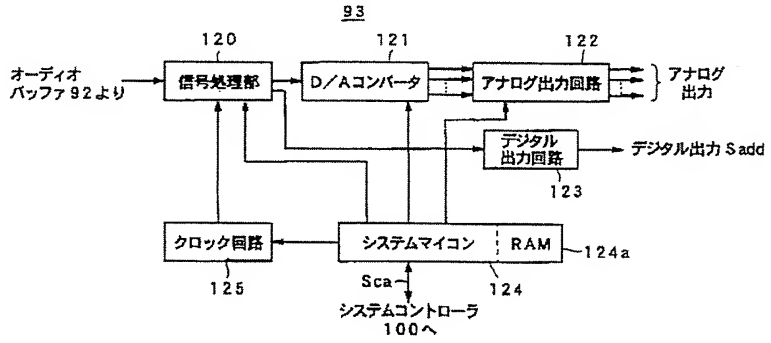
【手続補正７】
【補正対象書類名】図面
【補正対象項目名】図１５

＊【補正方法】変更
【補正内容】
＊　【図１５】



【手続補正８】
【補正対象書類名】図面
【補正対象項目名】図１６

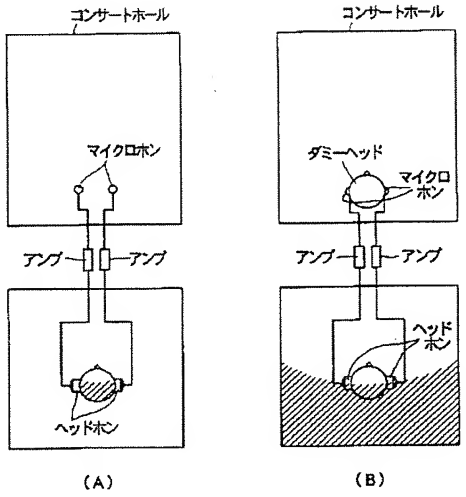
※【補正方法】変更
【補正内容】
※　【図１６】



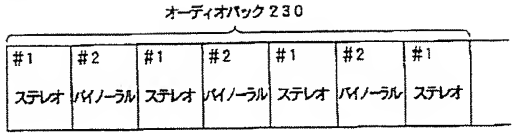
【手続補正９】

【補正対象書類名】図面

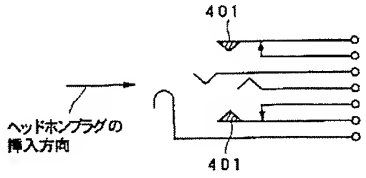
【補正対象項目名】図１７
【補正方法】変更
【補正内容】
【図１７】



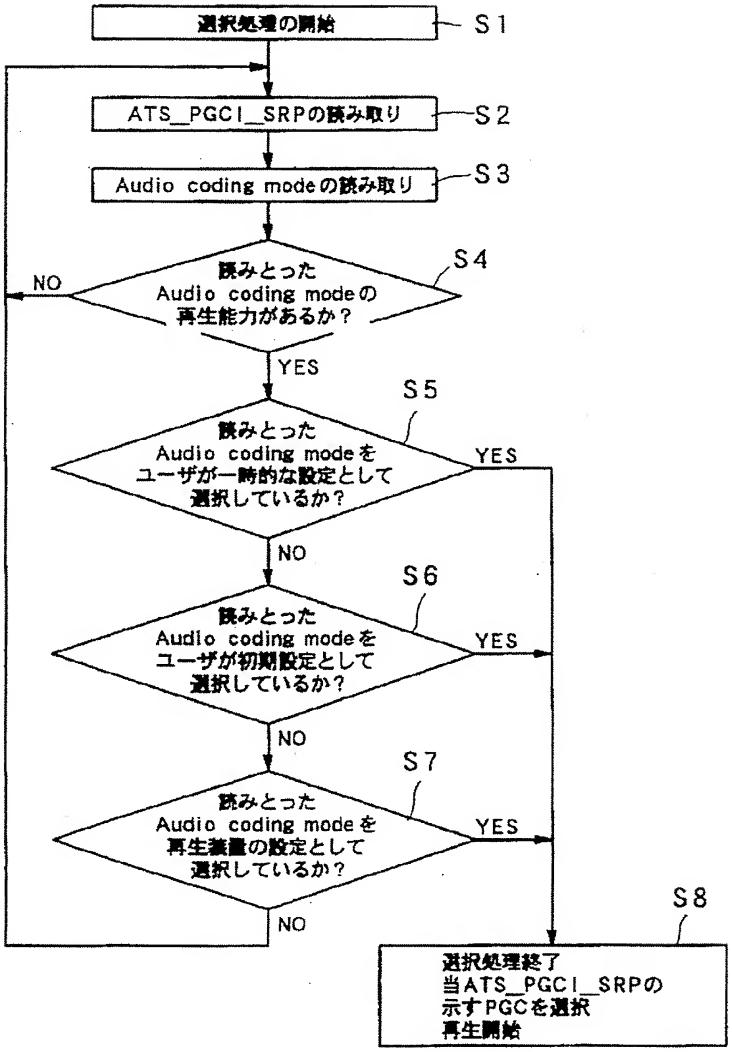
【手続補正１０】
【補正対象書類名】図面
【補正対象項目名】図１８
【補正方法】変更
【補正内容】
【図１８】



【手続補正１１】
【補正対象書類名】図面
【補正対象項目名】図１９
【補正方法】変更
【補正内容】
【図１９】

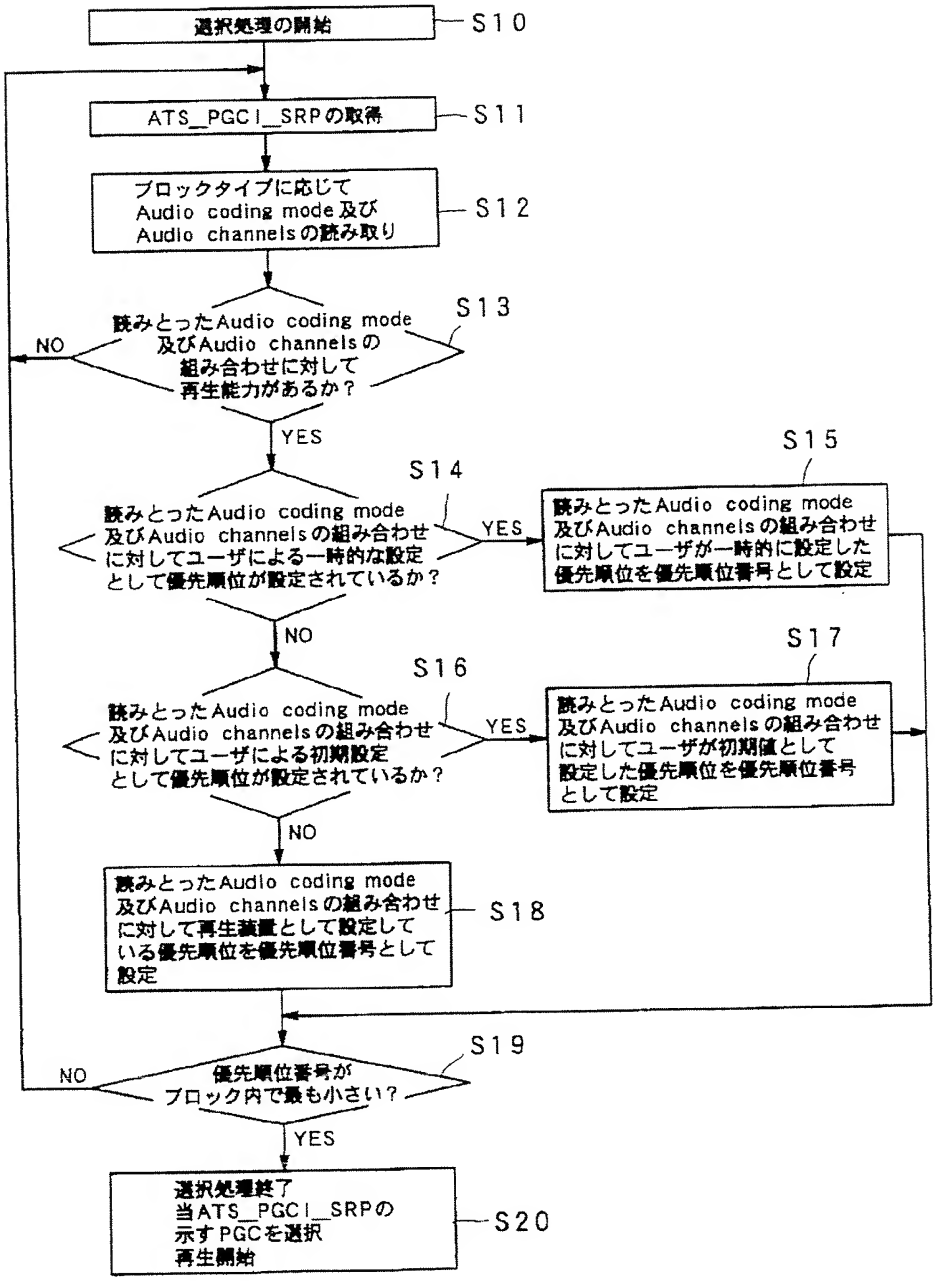


【手続補正１２】
【補正対象書類名】図面
【補正対象項目名】図２０
【補正方法】変更
【補正内容】
【図２０】



【手続補正１３】
【補正対象書類名】図面
【補正対象項目名】図２１

【補正方法】変更
【補正内容】
【図２１】



フロントページの続き

(72)発明者　江間　祥三
埼玉県所沢市花園４丁目2610番地　パイオニア株式会社所沢工場内

(72)発明者　高橋　外喜博
埼玉県川越市大字山田字西町25番地１　パイオニア株式会社川越工場内

(72)発明者　長谷川　義謹
東京都目黒区目黒１丁目４番１号　パイオニア株式会社本社内

【公報種別】特許法第１７条の２の規定による補正の掲載
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【手続補正書】
【提出日】平成１２年３月８日（２０００．３．８）
【手続補正１】
【補正対象書類名】明細書
【補正対象項目名】００６０
【補正方法】変更
【補正内容】
【００６０】（1.2）論理フォーマット
次に、図１に示す物理的な区分により記録された情報を組み合わせた論理的フォーマット（論理構造）について図２を用いて説明する。なお、図2に示す論理構造は、その構造で実際にＤＶＤ１上に情報が記録されているのではなく、図2に示す論理構造で図1に示す各データ（特にセル２０）を組み合わせて再生するための再生制御情報（アクセス情報又は時間情報等）がＤＶＤ１上の、特にＶＴＳＩ１１の中に記録されているものである。
【手続補正２】
【補正対象書類名】明細書
【補正対象項目名】０１９０
【補正方法】変更
【補正内容】
【０１９０】（5.1.2.2）ＡＴＳ＿ＰＧＣＩ
サーチポインターのテーブルに続いて、各タイトルに対応した再生制御情報としてのＡＴＳ＿ＰＧＣＩ２７６が並び、テーブルを構成している。